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Improved Air Purifier.

The object of this apparatus is to filter and purify the impure air for respiration, to dry it when too damp, and, in summer, to cool it—somewhat as we would filter, purify, and cool foul water if obliged to use it for quenching thirst.

Practically it is found that when the charcoal, lime, and ice or water are properly provided, and the valve fully open, an apparatus occupying a space of only 15 by 23 inches on the floor, and 6 feet 6 inches high, supplies from 30 to 80 cubic feet per minute, in one constant current of perfectly pure air, dried and cooled to any desirable extent. It does this in any position in which it may be needed, without the necessity of specially receiving air from outside the apartment to form the current, and without any machinery of any kind to become disordered.

The materials used for purifying and cooling the air cause, at the same time, the circulation; and, when properly provided with these, it must continue to blow as long as the law of gravity continues to act. With it we can always sleep in pure air; and persons can even remain in the warmest and most filthy hospitals in the South, and, at the same time, be enveloped in, and breathe, an atmosphere as pure and as exhilarating as was ever breathed upon the hights of Oregon.

The expense of materials—that is, ice, lime, and charcoal—for providing a steady current of 50 cubic feet per minute, perfectly purified, and, in the hottest weather, cooled 20° and properly dried, has been less than two cents per hour in this city. Much of the season it is not necessary to cool it over 4° or 5°, merely enough to keep up the circulation through the disinfecting material.

Fig. 1.

LYMAN'S AIR PURIFIER.

In the lower part of the apparatus, upon the wire-gauze bottoms of the drawers, L L, (Fig. 2), are placed lumps of unslacked lime. The air in contact with the lime gives off its moisture and its carbonic acid. This warms, rarefies, and causes it to rise. The air to supply its place enters through the valve door, E, and flows in the direction of the arrows. D is a deep drawer, with wire-gauze bottom, filled with charcoal. The air next flows up through this charcoal filter and the ascending flue, F, and comes in contact with the metallic roof, G through which it gives off a part of its extra heat. It next passes over and through the fragments of ice in the chamber, A, where it is still further cooled and condensed, and falls down through the grate and the descending cold-air flue, C, and is delivered through the opening, B, between the pillow and head board of the bed, as shown in Fig. 1. In hot weather the ice alone, without the aid of lime, causes quite a brisk circulation. In any weather the lime alone will produce quite a steady current. Half a bushel of unslacked lime has blown night and day for ten days, apparently without a moment's intermission. Both materials acting together produce quite a brisk current under all circumstances.

The spout, H, leads off the water, resulting from the melting of the ice, into a pan, from which it is drawn at will by the stop cock, I.

It is well known that there are immense amounts of minute particles of decomposing animal and vegetable matter floating in the air of cities, and more or less in all inhabited districts. There are also the deleterious gases, the products of the decomposition of animal and vegetable matter. These gases are carbonic acid and the compounds of ammonia and of hydrogen.

The air first passes through the lime. One hundred pounds of lime will absorb twenty-four pounds of carbonic acid gas even when slacked or saturated with moisture. Its power for absorbing other impurities is also well known, as it has long been in use for destroying offensive smells.

After leaving the lime, the air next passes in a zig-zag direction through the charcoal filter.

Experiments have repeatedly shown that each cubic inch of charcoal will absorb about 90 cubic inches of ammoniacal gas, about 80 of sulphureted hydrogen, and considerable quantities of other gases.

But this cubic inch of fresh-burned charcoal is not a mere sponge for holding impurities. Each one of its many thousand little cells is really a beautiful chemical laboratory, perfectly fitted up for decomposing impurities and storing away their products where they can do no harm. The most filthy exhalations, consisting of the minute particles of decomposing animal and vegetable matter, are collected by this charcoal, apparently as a filter of magnets would collect the minute particles of iron floating through it in the air. Here, in these little cells, these impurities are decomposed, and here their elements are stored away.

The most disgusting gases—the products of putrescence—are sulphureted hydrogen and compounds of ammonia. The first is always present where bilious and intermittent fevers, agues, etc., are generated, and, hence, is supposed by some chemists, to be a principal cause of these diseases; while, for the same reason, the sulphuret of ammonia is supposed by some chemists to be the prime cause of typus and typhoid fevers, etc. The charcoal seizes the ammonia, takes it into its little cells and causes oxygen from the atmosphere to unite with it, and thus forms dilute nitric acid and holds it there simple sour water, a harmless sub-

stance. In the same way each cubic inch of charcoal will absorb enough of sulphureted hydrogen to instantly kill a dozen men, if Dupuytren and Thenard's experiments are reliable; and combining oxygen with it forms a few drops of dilute sulphuric acid, which may all be taken with impunity by a single child. These dilute acids remain in the charcoal until it is reburned.

According to Dupuytren and Thenard the 1-1500th of this gas in air is instantly fatal to a small bird; 1-1000th killed a middle-sized dog; and a horse died in an atmosphere which contained 1 250th of its volume. It does the mischief by decomposing the blood in their lungs when inhaled by them.

Finally, the air passes through the fragments of ice. Here it is washed as by a hail storm. The water on the surface of this ice is also a powerful absorbent of these impurities. It absorbs sulphureted hydrogen, and also deprives the air of any compounds of ammonia.

"Ammoniacal gas has a powerful affinity for water. Owing to this attraction, a piece of ice, when placed in a jar of ammonia, is instantly liquified, and the gas disappears in the course of a few seconds. Davy, in his 'Elements,' stated that water at 50°, when the thermometer stands at 29·8 inches, absorbs 670 times its volume of ammonia. According to Thompson, water at the common temperature and pressure, takes up 780 times its bulk."—*Turner's Chemistry, article "Ammoniacal Gas."*

The air is also dried by coming in contact with the ice. By being cooled its capacity for moisture is lessened, and the moisture is deposited on the cold surfaces of ice even more abundantly than upon the pitcher of ice water.

The following table shows the amount of moisture contained in one cubic foot of air when saturated, at different temperatures:—

	Grains.
At Zero	0·18
32°	2·35
40°	3·06
50°	4·24
60°	5·82
70°	7·94
80°	10·73
90°	14·38
100°	19·12

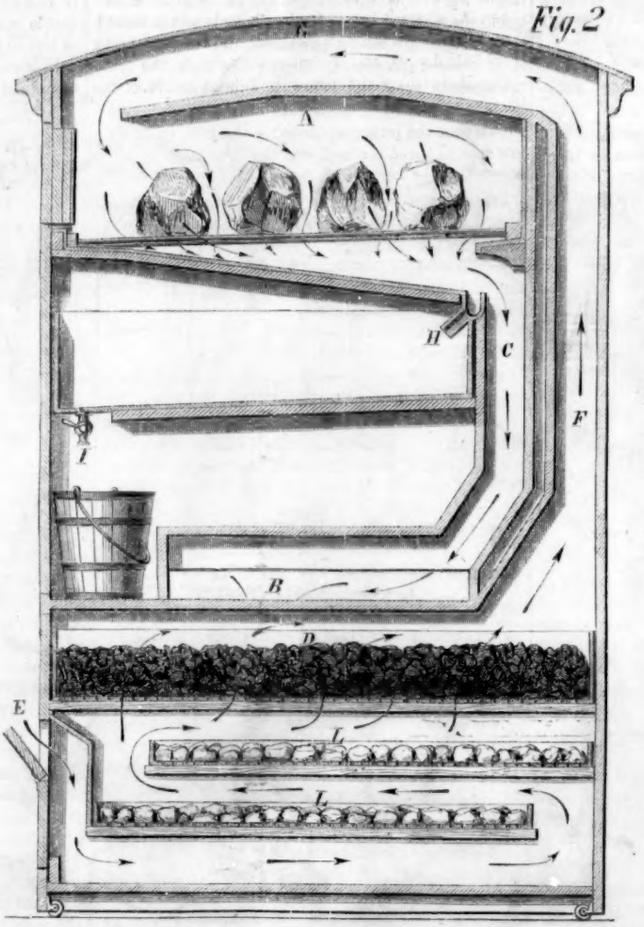
An inspection of the above table will show that if the air is 80° temperature and saturated, it would be possible to reduce its moisture from 10·73 grains to 2·35 grains per cubic foot by simply passing it through fragments of ice broken sufficiently fine. We have carefully weighed 20 pounds of ice before putting it in this apparatus, with the lime and charcoal left out, and received from it over 21½ pounds of water. The 21½ pounds of water were rendered exceedingly disgusting to the taste by the filth that had been collected from the atmosphere in their passage through the ice.

Here, then, we have in this apparatus three of the most powerful absorbents of impurity known, and when they are properly supplied, the air passing alternately through each, is rendered absolutely pure.

In order that the person shall always be immersed in pure air, the bedstead is made with its sides raised near the head and foot, as shown, and strong curtains are hung inside on the buttons, S S, Fig. 1. This forms a sort of reservoir, or bath. The pure air, which even in cold weather is 3° or 4° cooler than the other air of the room, is flowing in near its bottom, between the pillow and purifier, or head board, as shown by the arrows. The current is generally broken up by a sort of screen before the pipe, and it moves slowly over the pillow. This cool air may be felt flowing over the top of the reservoir where the side is lowest. If the curtain is let down the cool air may be felt pouring out toward the floor. While the bed is occupied, the curtain should always be kept tightly closed.

The apparatus is also combined with desks, and made in various other forms. Rooms are easily and cheaply cooled in warm weather, and ventilated with it. In such cases, even when the temperature, as shown by the thermometer, is not lowered, the air, on account of its purity and dryness in hot damp weather, seems 10° lower, and the change on entering it is very agreeable.

Fig. 2



LYMAN'S AIR PURIFYER.

Steel Pens.

Swedish iron is said to be the best material for pens. It is converted into steel on the old plan in a furnace, or by the new process of Mr. Bessemer, and subsequently hardened by tilting, casting into ingots, and rolling it into thin sheets. The consumption of steel in this way is enormous. As much as four-and-twenty years ago it amounted to 120 tuns annually, and was equivalent to about 2,000,000,000 of pens. This quantity is now greatly increased in consequence of the penny postage and the improvements in steel-pen manufacture. Some idea of it may be gathered from the fact that pens may now be bought by the trade at 4d. per gross, the box included, and that there are houses which produce 20,000, 30,000, and even 50,000 pens daily throughout the year. The art of steel-pen making has never been brought to greater perfection than in the manufacture of lithographic "crow-quill" steel pens. They are very small, as the term indicates, and are adapted to the finest shading. Their chief use is in tracing in crimson lake, and also in lithographic ink on "transfer paper," which has the remarkable property of discharging all its inked line on the stone, so as to make a complete transfer of the writing or drawing.

Glycerin Ointment.—Melt together spermaceti, ½ oz., and white wax, 1 drachm; put them into a stone mortar, add glycerin, 1 fluid ounce, oil of almonds, 2 fluid ounces, and rub them together until cold. Used for chapped hands, etc.

Prof. Agassiz is following the upward course of the Amazon River, and has already discovered sixty new species of fish.

Independence vs. Impudence.

There is no trait in a workingman's character which commands more ready respect than a manly independence. This is true of employer as well as apprentice boy. A man of known independence is treated with respect and consideration by those holding superior positions; and why? Simply because that any treatment short of proper, will not be endured. The independent man knows his rights and dare maintain them.

Independence is always founded upon ability; the workman feels his capability to sustain his position without cringing to the frowns of elevated incapacity, or bowing submissively to unmerited censure from purse-proud, ignorant employers.

Independence, while demanding proper treatment for its possessor, dare, at the same time, give the same to all others, irrespective of position. An independent man, while demanding an apology where one is required, has the manliness, if in error, to make one himself to either superior or inferior.

Independence, like all genuine, meritorious traits, is liable to be counterfeited, and its counterfeit presentment is impudence, which is always founded upon just the reverse of principle, from which springs true independence.

Impudence is always the signboard of ignorance; the impudent workman knows not what treatment he should receive from his employer, or how, in return, he should behave toward him, but thinks that a saucy tongue is always in order, and that, upon all occasions, it is proper for him to show the little respect he has for his employer or his fellow workman. This is to be regretted, from the effect it has upon those just entering upon life as mechanics; they invariably consider the least restrictions upon their actions as meriting insubordination; the impudent, incompetent, is made their beau ideal of what an independent man ought to be, while the unostentatious worth of the really independent man is looked upon as a truckling fellow, one who will suffer in preference to assuming a self-defense. A greater mistake is never made than when impudence is considered a mark of moral courage, for the two are never found in the one person, while true, unostentatious independence is always allied to and accompanied by true courage.

Impudence is ever trying to hide its defects by bluster and assumed worth, knowing well that if it could be turned inside out that it would be found to be utter worthlessness; while independence is satisfied to let time and circumstances define the true bearings of all minor questions.

Men, as well as apprentices, should bear in mind that impudence is not independence; also, that while an impudent man is never independent, an independent man is never impudent.—*Fincher's Trade Review.*

Patents Issued this Year.—The number of patents issued since Jan. 1, 1865, is 6,220. The estimated number to be issued during the coming month is 450, making a total of 6,670 for the year 1865. The number issued in 1864 was 5,220.

The American Academy of Arts and Sciences has given the Rumford gold medal to Prof. Treadwell, of Cambridge, "for improvements in the management of heat, made and put in practice by him in constructing cannon of a series of coiled rings, in the year 1842."

The Indiana Legislature lately passed a resolution inquiring into the expediency of licensing locomotive engineers, making them all pass examination as to qualifications, moral character, etc.

LATEST FOREIGN INTELLIGENCE.

SERPENTINE.—Among the ornamental building stones introduced during the past few years in the buildings of London, and other large cities, granite and serpentine have advantages which no other stones yet tested can claim—great durability combined with extreme beauty. The fracture of the common serpentine is harsh and brittle, but that of the commercial serpentine is concoidal, breaking in flakes like slate. It is adapted for taking the finest carving, and wears even better than granite, inasmuch as lichens (which, of course, harbor insects and retain damps) will cling to granite, but not to serpentine. Several church towers in the neighborhood of the Lizard illustrate this fact. Serpentine also retains its polish out of doors. In the Geological Museum at Oxford there were recently a number of columns representing the various limestone marbles and ornamental stones. The roof of the museum was removed, and continued to be so, the columns being meanwhile wrapped round with hay bands. When this covering was removed on the serpentine and granite the polish remained perfect, and upon those stones only. It will no doubt be interesting to numbers to know the comparitive degrees of strength of serpentine, Portland stone, and Devonshire marble, and, therefore, the statistics of the test made before the committee of the Institute of British Architects, on Aug. 7, last year, is subjoined. The shafts of each material were 1 foot in length and 3 inches in diameter. The trial resulted as follows:—

	First fracture. Tuns.	Broken. Tuns.
Portland stone, No. 1	7·3	10·25.
Portland stone, No. 2	8·7	8·7
Devonshire marble	9·2	10·7
Serpentine, No. 1	12·15	16·25
Serpentine, No. 2	16·92	17·62

The figures relating to the fractures represent the hydraulic pressure applied, and indicate the superior weight-bearing qualities of serpentine. Thus it is shown that in regard to polish, hardness, strength, durability, and beauty, serpentine is a stone that is very desirable for the ornamentation of buildings, and in an age when the adornment of private dwellings and public edifices is held to have an effect in increasing the refinement and taste as well as the wealth of the country, the extension of this useful branch of manufacture may be regarded with satisfaction, not only in the interests of a company whose management has been characterized by energy and enterprise, but also in the interests of the public, and of Cornwall especially.

[In Middlefield, Mass., says Feuchtwanger's "Treatise on Gems," there is a bed of serpentine one-fourth of a mile wide and six miles long; enough to supply the whole world.—EDS.

The *Mechanics' Magazine* says:—"It has been decided to adopt throughout the naval service a new pattern of quill friction tubes, fitted with loops and studs, on the gun, the detonating hammers and tubes, as well as the friction tubes now in use, being accordingly withdrawn, and the new tubes universally adopted. All guns now in store at the home stations, whether in ships, in commission, or in the steam reserve, are to be fitted with the stud, and the vents enlarged at the top, as recommended. Ships now on foreign stations will retain the present proportion of detonating tubes until put out of commission.

MANUFACTURE OF WELDED IRON TUBES.—In the ordinary manner of constructing heating furnaces used in the manufacture of these tubes the furnace is made in two compartments, each compartment being provided with a fire-grate. One of the said compartments is called the back hole or warming furnace, and the other is called the welding furnace. The skelp, or partially formed tube to be welded, is first heated in the back hole or warming furnace, and afterward transferred to the welding furnace, where it is raised to a welding heat. The invention of Mr. James Fisher, of West Bromwich, consists in dispensing with the fire-grate at the back hole or warming furnace, and in so constructing and arranging the said back hole or warming furnace and the welding furnace, that the warming furnace shall be heated by the waste heat from the welding furnace. He builds the warming furnace and welding furnace side by side in the ordinary manner, but builds the warming furnace without any fire-grate. He builds the welding furnace in the ordinary way, excepting that he closes the end of the said furnace, instead of making it communicate directly with the stack. He perforates the wall separating the two furnaces with a series of holes, through which holes the flame and heated air from the welding furnace pass into the warming furnace, and from thence to the stack. By this arrangement the two furnaces are heated by the fire from one grate—namely, by the fire of the welding furnace grate. It is claimed, that by constructing the heating furnaces according to this invention great economy is effected in the fuel employed.

THE *Bellerophon* is ordered to be fitted with a light iron head in order to lessen the force of the large wave now thrown up by the frigate when going through the sea at full speed, and, at the same time, to give her head a handsomer appearance than it at present possesses. During the time the improvements are being effected alterations will be made in the screw propeller, the recent trials having shown that the principal cause for the comparatively low rate of speed realized was the character of the screw fitted to her, which was much too ponderous.

THE extreme heat, which prevailed on the continent during the vintage, produced a curious result. The grapes being in general very ripe fermented in the vats with extraordinary rapidity. A great portion of the saccharine matter had not time to be converted into alcohol, and the wine, on account of the saccharine matter remaining in it, will ferment for a long time in the cask.

THE fish in the river Thames are bearing testimony to the beneficial effects of the main drainage scheme. The chairman of the Metropolitan Board of Works at the last meeting stated that Mr. Webster had sent him a fine roach that was caught in front of the Parliament Houses. He kept it for three days, but could not keep it longer. Since then other specimens of roach and dace have been caught there.

The Best Substance for Making Cloth and Leather Water-proof.

Dr. F. Grace Calvert, F.R.S., F.C.S., in one of his recent lectures on chemistry applied to the arts, introduced the interesting and valuable invention of one of the most learned and eminent chemists of England —Dr. J. Stenhouse, F. R. S.—who has devised quite a new method of water-proofing vegetable and animal tissues and fabrics. Previously to his discovery, the modes of water-proofing consisted in using bees-wax and various kinds of drying oils, such as linseed, the siccation of which is enhanced by boiling them with peroxides of lead or manganese. Further, you are all aware of the extensive use which has been made of caoutchouc and gutta-percha for water-proofing purposes. Dr. Stenhouse's water-proofing material is a white solid substance, having no odor, undergoing no change through the action of the atmosphere, and which has acquired of late great popularity, by the application which has been made of it as an illuminating and lubricating agent—I mean paraffin, the discovery of which, in a commercial point of view, and its introduction into public notice, are due to Mr. Young, of Bathgate, near Glasgow, who has established one of the largest manufactories in the world for the production of this article, notwithstanding it was considered a commercial novelty in 1852. Dr. Stenhouse found that if he employed pure paraffin for water-proofing, owing to its tendency to crystallize, it would not adhere sufficiently to fabrics. He therefore conceived the happy idea of adding to it a few per cent of linseed oil, which overcame the defects presented when paraffin was employed alone, effecting a better adhesion between the water-proofing material and the textile fabrics, and rendering leathers more flexible. Dr. Stenhouse melts together paraffin oil with a few per cent of linseed, as above stated. He runs the whole into cakes, and, in order to apply this water-proofing agent, he heats the cake and rubs the materials over with it, or spreads the melted mixture over the fabric by means of a brush. His process is applied with great advantage by Messrs. Silver & Co. to the water-proofing of soldiers' tents, and other materials of that class, to the great comfort of the soldiers, for, without increasing the weight of their tents, it renders them impermeable, and protects the men from rain and its attendant discomfort and danger. Another most useful application of Dr. Stenhouse's water-proofing material is the rendering of leather impermeable. By examining the specimens you will immediately see the immense advantage that cavalry will derive from having their saddles rubbed over with this preparation, as it renders the leather incapable of absorbing moisture, and enables the soldier to mount his horse after heavy rain with as much comfort as if it had remained under shelter. It also renders the soles of shoes quite impermeable, and at the same time communicates to them great flexibility, so that the boots of navvies and other similar articles are rendered far more useful and durable, as we all know that the constant wetting and drying of leather expedites in a marked manner its decay. There is one more application of Dr. Stenhouse's water-proofing to which I should wish to call your special attention, as it is of interest to the manufacturers of Manchester and of Lancashire generally. In those districts large quantities of what are called water-proofing materials are used in packing the goods, and preserving them from external wet or injury. Many of these materials are made by covering a coarse calico fabric with a coating of boiled linseed oil, but this class of packing is very imperfect, and loses its strength rapidly, especially in hot climates, owing to the fact that boiled oil absorbs oxygen and carries it on to the fiber, oxidizing it, and, thereby, soon destroying its tenacity. By applying Dr. Stenhouse's process to the fabric previously to the drying oil, not only is great impermeability attained, but the fiber, being saturatad with paraffin, is preserved from the subsequent oxidation which it would undergo under the influence of the atmosphere in the presence of the boiled oil alone.

New Silver Salt.

It is stated that M. Meynier, of Marseilles, is manufacturing a salt which he calls an ammoniacal nitrate of silver, or nitrate of silver and ammonia analogous to the ammoniacal sulphate of iron introduced by him for developing.

The advantages M. Meynier claims for his new salt are the following:—It is much more sensitive to light than nitrate of silver, and, therefore, the time of exposure with this salt is much shorter. The image obtained is sharper, and the sensitive plate can be kept in good condition for a longer time before exposure. Paper sensitized with this salt is also more sensitive, and its use does not necessitate so much care in the selection of a paper, as a paper which will not give passable pictures with the ordinary silver bath will yield good pictures with the new preparation. Another advantage claimed for this salt is that it dispenses with all necessity for ammoniacal fumigation of albumenized paper, giving results equal in all respects to those obtained on fumigated paper. It is used in the same proportions as nitrate of silver for forming the baths. For negatives on collodion or albumen, the bath should be slightly acidulated with glacial acetic acid, in the proportion of two or three drops of acid to four ounces of solution. The solution for paper pictures, on the contrary, should be rendered alkaline by adding thirty or forty minims of liquid ammonia to a quart of solution. The salt should always be dry and quite neutral before being used; if it be acid, a little more ammonia must be used in the bath for paper. Last, and not least, the price is such that a saving of thirty per cent of the nitrate of silver now used is expected.

M. Niepce de St. Victor promises in his next memoire to describe a new mode of preparing a silver plate, by which he obtains not only the natural colors, black and white, but the luster of metals and the sparkling of precious stones. The labors of this *savant* are extraordinary, and among all workers in our science none engage in more delicate and refined researches, or in the pursuit of experiments for results so marvelous, as the eminent philosopher of the Louvre.

THE cohesive force of the best red sealing wax has been proved to be equal to 1,500 lbs. per square inch, and that of the black sealing wax rather more than 1,000 lbs. to the square inch; the deficiency in the latter is attributed to the diminished quantity of lac used in the composition. The cohesive force of solid glue was found to be 4,000 lbs. per square inch; that of cast iron is 25,000 lbs.

WATER-PROOF GOODS.

On page 17, of the present volume of the SCIENTIFIC AMERICAN, we noticed the rapid progress of manufacturing in Bridgeport, Conn., and spoke of the American Water-Proof Company as being about to start a large concern at that place. Since our notice the works of that company have been started, and a somewhat extended account of its operations appeared in a late number of the Bridgeport *Standard*—an enterprising and well-edited journal published in that city. The President of the company is Hon. Thomas A. Jenckes, Member of Congress from Rhode Island.

The goods are manufactured under patents granted to Thomas Crossley, agent of the works. The articles manufactured consist of carpets, piano covers, window hangings, water-proof cloth, etc., and an article composed of wool, silk, fur, cotton, flax or other animal or vegetable fiber, in combination with a water-proof compound, which renders the article, when complete, water, dust, wind and moth proof, and, at the same time, imparts to the fabric a firmness of structure and brilliancy and permanency of color. The wool is received at the factory in the fleece, and is passed through the various processes necessary till it comes out ready for the market.

For many years Mr. Crossley has been giving his attention to the manufacture of an article of carpet by the stamping process, which should excel all others in durability, beauty, and price. In prosecuting this work he has met, like all inventors, with many serious obstacles. He invented the first power press ever used for the printing of carpets, a huge mammoth machine, which stands on the first floor of the factory. Before this, however, he tried cylinders, printing after the method of calicoes, delaines, etc., but this would not work. He then invented the mammoth press, and had the designs cut into wooden blocks, but the dye and steam caused the blocks to swell and crack so that they too had to be laid aside. He then formed an idea of electrotyping his patterns, but here again he met with difficulties which electrotypists assured him they could not overcome. Ascertaining the nature of these difficulties he applied himself personally to the task, and was rewarded with success. The next step was to get the designs from which to take the wax impressions, and he originated a very simple, novel, and effectual way of doing it. The room in which this is done, looks like the composition department in a printing office. There are the fonts of types, only instead of having letters on their face, they are perfectly smooth and flat. The patterns are placed before the workmen, the same as the copy before the compositor, and he proceeds to set it up, each color by itself, and, when complete, the form is locked up, and the impression on the wax made, after which the usual mode of electrotyping is gone through, and a metal plate produced, which works under the press.

The materials used in the manufacture of carpets by this process are so firmly and compactly put together by the water-proof compound as to insure them durability. The colors are fastened by steaming. Colors made upon any animal fiber, such as wool, silk or fur, are rendered vastly more durable by this process than simple dyeing. The principal reason is, that steam is hotter and more searching than warm water. Steam expands the fiber which is, when in a healthy condition, hollow or tubular, and forces the color inside the fiber, which, exposed to cold water, as in washing or rinsing, becomes collapsed or flattened, and is made thus to retain the color forever afterward. In the ordinary process of dyeing, the deposit is made on the outside of the fiber, and, consequently, soon wears off or is destroyed by the rays of the sun. This is the chief reason why steam colors are fast, and dyed colors fugitive; not as is generally supposed on account of the peculiar nature of the drug used. The brilliancy and permanency of the color, scarlet, is not the result of the powerful nature of the cochineal used in dyeing, but because the effect of the drug cannot be obtained except the yarn or cloth is boiled in the liquor. It is the boiling that fastens the color, and not the drug—the latter simply gives the shade required. Steaming colors, as it is done by the Company, makes them all alike fast, for all are exposed to the same degree of heat.

THE PROGRESS MACHINE WORKS.

It is always pleasant to put on record instances where energy and ingenuity have been rewarded—where men, firm in the faith that success in life was certain if they did but set to work manfully, determinedly, with a conviction that brighter days were beyond. There are many men in this country that fare sumptuously every day, whose early lives were continual scenes of want, and whose opportunities for education were extremely limited. They have attained what all men seek—riches—by steady adherence to one point, to one line of business, and have suffered nothing to turn them aside.

We lately visited a machine shop in this city, that of Messrs. A. & F. Brown & Co., at Nos. 57,59 and 61 Lewis street, that led us to the reflections above. These men began business in a very small way. They had no capital to speak of, and willingly took such jobs as they could find, *and did them well.* That was the great point—they did the work well—so that those who hired them once did again. In this way they created a reputation for good workmanship, which was the best capital they could have had.

They went to merchants and solicited jobs of repairing, no matter how small or trifling, and, having done them, received their pay. From such small things greater ones sprung, and they now occupy three large three-story buildings in Lewis street, this city, Nos. 57, 59, and 61, which they call the Progress Machine Works. Here they build oscillating steam enginesof a novel pattern, quartz crushers, grain elevators, steam pumps, and a variety of general machinery They also cut gears, or cog wheels, for a number of different machine shops, some of them the largest in the city.

The oscillating engines built by the Messrs. Brown can be found illustrated on page 255 of the current volume, and they have recently designed a very novel and efficient pump, which seems to be valuable. They manufacture a safety governor, which, by a very simple arrangement, stops the engine immediately if the belt runs off, so that no damage is caused by the engine attaining a high speed. This governor should be on all steam engines.

We can commend these machinists to public favor, for we believe them to be imbued with the right spirit—with a desire to make none but the best machines with the best workmanship.

New Photographic Processes.

Cosmos states that M. Julius Schnauss has discovered that an aqueous solution of the soluble constituents of dried raisins, deprived of the tartrate of potash therein contained, is a photographic agent of considerable value in the dry collodion process. It does not matter what sort of raisins are used, the different descriptions only causing variations in the process according to the greater or the less quantity of sugar they contain. The solution is prepared by boiling for several minutes 100 grains of dried raisins in 500 grammes of distilled water; the liquid should be filtered when cold, and crystals of tartrate will soon be deposited. All the other constituents of the juice of the raisins will be found in the remaining liquid. If the water in which the raisins had been boiled had been filtered while warm, some of the tartrate of potash would have remained in solution, and had a pernicious effect on the collodion film. The sugar contained in the solution is the glucose, into which the grape sugar is changed during the dessicating process. The following are the different manipulations which constitute the new process of M. Schnauss:—

The glass plate is first covered with gelatin or india-rubber, as in Major Russell's process, to support the collodion film. Any collodion of commerce may be used, as its composition does not make much difference in the resulting picture. The coated plate is next immersed in the silver bath, and afterward scrupulously washed in water till it contains no free nitrate, the raisin solution being then flowed over it two or three times. The plate is then washed once more and allowed to dry in the dark. The time of exposure with these plates varies from thirty to sixty seconds, according to the quality of the lens, subject, and light; so the process is rather a rapid one. M. Schnauss prefers an alkaline developer, especially one recommended by Mr. Sutton, as follows:—One part of carbonate of soda is dissolved in 500 parts of water; this is allowed to act on the plate, after which it is poured off into the developing glass, and twenty drops of a two-per-cent solution of pyrogallic acid in alcohol added. This is next poured over the plate, and rapidly develops a phantom image; but before the intensification is proceeded with it is necessary to apply a weak solution of acetic acid to the plate to remove all traces of the alkali, and so prevent fogging. The picture is then intensified with pyrogallic acid and nitrate of silver in the usual manner. The process is both simple and rapid in its results, but the plates so prepared will not remain in good condition more than forty-eight hours. Their keeping qualities are not good.

The same number of *Cosmos* contains a method of intensification by means of a double cyanide of iron and uranium. One solution of ferrocyanide of potassium is prepared, and another of sulphate of uranium, and at the moment they are required for use the two solutions are mixed in equal proportions. When the two are mixed decomposition takes place, sulphate of potash and a double cyanide of iron and uranium remaining in solution. When this is poured over a negative already fixed, the double cyanide turns all the reduced silver on the image to a deep brown color. By means of this intensifier, says M. Hermann Selle, the tone of the negative may be deepened as much as is judged necessary, but if the solution be very concentrated the action is instantaneous. The negative blackens very much in drying, but after varnishing it recovers its former degree of intensity. This method of intensification is considered a very good one for the reproduction of engravings, since the deposit is both vigorous and regular.—*British Journal of Photography.*

New Photographic Developer.

M. B. de Montfort has discovered a new developer, with which he is so pleased that he says that, when photographers have once tried it, they will thenceforth use no other. "I do not," he says, "say that the idea of mixing sulphate of copper with protosulphate of iron is new, but I make the mixture in a different manner and in entirely different proportions to those hitherto tried by any other photographers.

"I first dissolve five grammes of sulphate of copper in 100 grammes of common water. When the solution is complete I add to it 200 grammes of a saturated solution of protosulphate of iron. I next add five grammes of nitric acid, as well as 1,500 cubic centimeters of water, and filter the whole.

"This developer brings out the image very rapidly, yet it is not necessary to pass it over the plate so very quickly, to avoid stains and spots, as is the case in a very strong iron developer. I never have stains or spots. But that which is a most decided advantage is, that the intensification can be proceeded with with the same solution, without taking the trouble to employ new. It suffices to pour it back into the developing glass, and to add five or six drops of a three-per-cent solution of nitrate of silver. The intensification may be commenced immediately without even washing the plate, and will proceed without stains and much more rapidly than with the pyrogallic acid used by most photographers, after the development with iron. However, if the time of exposure has been right, there will be no necessity to intensify at all, as the developer will at once give a vigorous and transparent image. The process is evidently an economical one, both as regards materials and time. The collodion I commonly use contains nothing but iodide of ammonium and bromide of cadmium."

Should other photographers obtain the same results, it is evident that this developer must come into common use, and we recommend a trial of this new process by our English readers.—*British Journal of Photography.*

IRON CARS.—A correspondent suggests that if cars were made of iron there would be an immense saving of life and limb. He instances that, in the summer of 1862, he accompanied an excursion train from Cambridge to Portsmouth, when there was a collision which killed and wounded many passengers. One car in the train was made of iron, and not one person suffered injury.

A GENTLEMAN named Frye has invented a traction engine for hauling carriages on common roads which weighs only 32 tuns.

RECENT AMERICAN PATENTS.

The following are some of the most important improvements for which Letters Patent were issued from the United States Patent Office last week; the claims may be found in the official list:—

Sewing Machine.—This invention relates to a cloth guide for a sewing machine, which is composed of a fork with three or more prongs, so that the strain on the material to be sewed, as the same is drawn through the guide, produces the requisite friction, and no basting is required. By giving to the prongs of the forked guide an oblique position, the material to be sewed is carried up against the gage, and by using two or more guides placed side by side, or one above the other, two or more pieces of material can be sewed together, and a straight seam can be produced without basting. An adjustable gage, applied to the prongs of the guides, serves to regulate the position of the different pieces of material in relation to each other. The guide or guides are used in combination with the ordinary gage, which is adjustable, on an angular guide bar, in such a manner that when the guides and gage are not needed they can be pushed back and turned up on the side of the standard supporting the needle slide and mechanism for operating the same, and when said guides and gage are required, they can be readily adjusted in the desired position. Albin Warth, of Stapleton, N. Y., is the inventor.

Fan.—This invention consists in forming the body of a fan of one or more thin sheets or veneers of any desired kind of wood, fastened together by glue, cement, or by any other proper means, and attached to a suitable handle or stick, and also in imparting stiffness and strength to any and all kinds of fans, whether made of paper, card, silk, wood, etc., by forming and placing upon and entirely around their outer edges or rims a proper-shaped metallic band or bands, which are securely fastened thereto in any suitable manner. Benj. M. Smith, of New York City, is the inventor.

Attachment for Locks and Latches.—The object of this invention is to obtain a simple, economical, and burglar-proof attachment, which may be applied to all kinds of locks and latches without injury to the door, and which will render any ordinary lock or door to which said lock may be applied secure against burglary—the device being capable of being used as a night latch, or as an auxiliary attachment, or so as to form the only means for operating the bolt. Alonzo E. Dietz, Brooklyn, N. Y., is the inventor.

Turn-table for Railroads.—This invention relates to a new and improved manner of pivoted turntables for railroads, whereby the former are allowed to turn with but little friction, and the pivot kept in a proper lubricated state at all times. The pivot consists of a ball and socket, the latter being composed of two parts, and the lower portion made in the upper end of a fixed standard, the upper part of the socket being in a metal plate connected by rods to the standard, and all arranged and covered by a a cap. J. I. Kinsey, of South Easton, Pa., is the inventor.

Well.—This invention relates to wells which are made by sinking or driving a tube into the ground without first digging or boring a hole for it. One mode of making such a well is to drive into the earth a tube whose lower end is brought to a point, and which end is perforated, so that after the tube has been driven down to the place where water is found, such water can enter the tube through its perforations, and can then be pumped up by a piston in the ordinary way. This invention is meant as an improvement on that mode, and it consists in driving down a soil pipe of sufficient length to reach a vein of water, and which pipe is lessened in diameter at a certain point near its lower end within it by a tapering swell. The cylinder or pump barrel is made conical or tapering at its lower end, and is, moreover, perforated in that part. On letting the barrel down into the soil or driving pipe, which pipe constitutes the well tube, its conical perforated end passes the said contracted part, but the part of the barrel which is of full size is stopped at the throat of the contraction and becomes wedged fast. The piston works in that part of the pump barrel which is above the contraction. The upper end of the pump barrel is contracted within, or has an internal flange against which the piston strikes when it is pulled up higher than its working stroke, and thereby loosens the barrel from the well tube, so that it can be drawn to the top of the well. James H. Bump, of Unadilla, N. Y., is the inventor.

Tobacco Cartridges.—This invention consists, essentially, in stiffening their bottoms so that they can be screwed down upon a tube leading to a smoking pipe or tube, and be sustained thereon without a bowl. The bottoms of the cartridges may be made of stiff thick paper, or other material, having a perforation through their centers, to enable them to be connected to a smoking apparatus. The perforation may be covered by a perforated diaphragm which will allow air and gases to pass, but will arrest fine particles of tobacco and ashes. A. C. Breckenridge is the inventor, and has assigned his patent to H. J. Hale, of No. 16 Beekman street, New York.

Hat.—The object of this invention is to improve gentlemen's hats, especially that class of hats whose bodies and brims are flexible, or made of flexible material, although it is applicable to all kinds of men's hats. It consists in placing around and attaching to the body of a hat at the place of its junction with the brim, or of incorporating in or with the body of a hat at that place, a wire spring, whose ends are united to form an unbroken ring. When the spring is placed on the outside of the hat, it is securely tacked to the body in or along the joint, where it will be concealed by the hat band, which is next placed over it. D. W. Gitchell, of No. 63 Broadway, New York, is the inventor.

Self-acting Brake.—This invention relates to an improved self-acting wagon brake, and it consists in having the brake shaft connected, in a novel way, with the front bolster of the vehicle, the bolster applied to the vehicle, the front end of the perch or reach slotted, and all arranged in such a manner that the front bolster will, under the gravity of the load, in descending an eminence, be made to serve as a lever to actuate the brake shaft and apply the shoes to the wheels. The invention further consists in applying and arranging the shoes in such a manner that they will not interfere with the backing of the vehicle. C. A. Smyth, of Charleston, Ill., is the inventor.

Process for Treating and Cooking Food.—This invention consists in a new process of treating and cooking food, wherein the substances to be cooked are inclosed within tight cans or vessels and treated in a steam-tight vessel or boiler under a heat exceeding that which marks the boiling of water in the open air, and in such a way as to shut off the access of atmospheric air, and the escape of vapor or volatile matter and aroma from such substances; or such substances may be treated in the boiler without first placing them in cans. Samuel S. Fitch, M. D., of New York, is the inventor.

Liquid Cooler.—This invention relates to a cooler for beer and other liquids, composed of series of chutes placed in an inclined position, and communicating with each other by means of suitable curved aprons in combination with chambers secured to the under sides of the chutes, and communicating with each other by means of similar pipes, in such a manner that the beer or other liquid to be cooled can be made to run down successively over the several chutes, while, at the same time, water or other cooling liquid is caused to run in an opposite direction through the chambers under said chutes, and the beer or other liquid to be cooled, while running over the chutes, is exposed on one side to the cooling influence of the atmosphere, and on the opposite side to that of the water or cooling liquid, and the operation of cooling is effected rapidly, and with little labor or expense. Chas. P. Zimmerman, of Newark, N. J., is the inventor.

Balance Side Valve.—This invention relates to a balance valve which is made in two parts, the bottom part being made to work steam-tight against the seat or bottom, and the top part steam-tight against the cover of the valve chest. The invention consists in the use of a follower and packing rings, in combination with the upper part of the valve, which is forced up against the cover of the valve chest by means of springs in such a manner that the valve is free to lengthen and shorten like a telescope, without allowing the steam to escape at the joint between its two parts, and the upper part of the valve is free to work steam-tight against the cover of the valve chest, whereas the bottom of the valve, at the same time, works steam-tight against the seat or bottom of the valve chest, and the valve is perfectly balanced. This patent was issued Nov. 21, 1865, to Stephen D. White, of Centralia, Ill.

Curious Obstacles to the Establishment of the Telegraph in India.

From an article in the *Atlantic Monthly*, for Dec., we extract the following passages:—

"The establishment of the electric telegraph in India presented some curious as well as difficult problems. In the first place, it was discovered that the air of India is in a state of constant electrical perturbation of the strongest kind, so that the instruments there mounted went into a high fever and refused to work. Along the north and south lines a current of electricity was constantly passing, which threw the needles out of gear and baffled the signalers. Moreover, the tremendous thunder storms ran up and down the wires, and melted the conductors; The Monsoon winds tore the teak posts out of the sodden ground; the elephants and buffaloes trampled the fallen lines into kinks and tangles; the Delta aborigines carried off the timber supports for fuel, and the wire or iron rods upon them to make bracelets and supply the Hindoo smitheries; and the cotton and ice boats, kedging up and down the river, dragged the subaqueous wires to the surface.

"In addition to these graver difficulties were many of an amusing character. Wild pigs and tigers, scratched their skins against the posts in the jungle and porcupines and bandicoots burrowed them out of the ground. Kites, fishing eagles, and hooded crows came in hundreds and perched upon the line to see what on earth it could mean, and, some times after a thunder storm, when the wires were wet, were found dead by dozens, the victims of their curiosity. Monkeys climed the posts, and ran along the lines, chattering and dropping an interfering tail from one wire to another, which tended to confound conversations with Calcutta."

Condensed Correspondence.

Messrs. Quarterman & Son write us, saying that a convenient way to keep cisterns clean is to insert a wire-cloth funnel in the top of the leader pipe, so as to prevent leaves from getting down.

Mr. W. McCracken, of Princeton, Ill., writes us a long letter on cotton cultivation, which we cannot publish entire. He says, however, that a great deal of the cotton grown at the South is upon hilly and stumpy ground, and in other situations which render the operation of a machine, as well as for picking the machine itself, an impossibility.

Mr. J. Henry Potter, of Bridgewater, Mass., writes concerning a small steam engine which he has built for driving a watchmaker's lathe; he being in the watch-repairing business. This steam engine is seven-eighths bore, and one three-eighths stroke, and has a horizontal cylinder. It has an oval boiler, thirteen inches greatest diameter, by eight inches high, which is worked by two kerosene burners. The engine makes about 300 revolutions per minute, works with great ease, and is a desirable and practical thing for small purposes. It carries ten pounds of steam.

Objection to Iron Cars—Immense Coal Traffic.

The practical objection to the use of wrought-iron cars, in transporting coal, is not the extra cost over wood, for that is more than compensated for in their increased durability; but it is the difficulty in repairing them. When the frames get bent it is next to an impossibility to get them straightened into shape again.

Some idea may be formed of the extent of the wear and tear of the rolling stock on coal-transporting railroads when we state that, on an average, one car out of every ten in use is daily put aside for repairs; of course some of them require only slight attention. The Reading Railroad has about eighteen thousand coal cars, and between two and three hundred locomotives employed in their coal traffic alone, which, the past year, has amounted to over three millions of tuns.

Notes and Queries

J. G. L., of *N. Y.*, asks:—"Where a person has been manufacturing a patented article, and the patent expires, is it lawful still to continue to stamp the article 'Patent,' with date, etc. If so, can other parties beside the original manufacturer so stamp them?" Ans.—You can continue to use the stamp; others can use it also.

A. N., of C. W.—In the article on small boilers we said the materials would cost $20; the labor would cost $75 more; the profit would be $20 more, which would make the boiler cost $115. Plenty of persons in this city will make one. You have only to send the order and the funds and it will be made.

Decimal, of Va.—Your engine is of 120 horse-power, provided 50 lbs. is the mean pressure throughout the stroke; but if the initial pressure is 50 lbs., and the steam is cut off before the completion of the stroke, the engine is of less than 120 horse-power. You must multiply by the average, or mean, pressure throughout the stroke. The rule is correct.

T. B. R., of Pa.—"Silliman's Philosophy" has an excellent treatise on electricity; there is also a good one in "Miller's Chemistry," republished by John Wiley, of this city. You can get a work on mathematical instruments of Henry Carey Baird, of Philadelphia.

W. W. H., of Conn.—You will save coal by running the engine slower and carrying higher pressure. But you must increase the size of your driving pulley to keep the same velocity on the main shaft—not decrease it, as you propose. We cannot give a more definite answer without a calculation of some length. You can readily try the experiment without much expense.

J. M., of C. W.—The only objection to petroleum as fuel for generating steam is its cost. One pound of petroleum will make just about as much steam as one and a half pounds of coal—petroleum, therefore, must be bought at about nine cents per gallon to be as cheap as coal at ten dollars per ton. Magnesium wire is made by the American Magnesium Co., Boston; price $6 50 per ounce. By sifting the powdered glass from out a quantity of gunpowder the explosive properties of the gunpowder are restored.

MARKET FOR THE MONTH.

The prominent features in trade during the month of November are, a considerable decline in the price of cotton cloths, and a steady progress in the extension of the credit system. The changes in the prices of the leading staples are shown in the following table:—

	Price Oct. 25.	Price Nov. 29.
Coal (Anth.) ₱ 2,000 lb.	$13 00 @13 50	$13 00 @13 50
Coffee (Java) ₱ lb.	32 @ 34	28 @ 29
Copper (Am. Ingot) ₱ lb.	31¼@ 33¼	42 @ 45
Cotton (middling) ₱ lb.	57 @ 60	52 @ 54
Flour (State) ₱ bbl.	$7 80 @ 8 75	7 90 @ 9 00
Wheat ₱ bush.	2 40 @ 2 80	2 25 @ 2 85
Hay ₱ 100 lb.	60 @ 65	60 @ 65
Hemp (Am. dre'd) ₱ tun.	310 00@325 00	320 00@350 00
Hides (city slaughter) ₱ lb.	11½@ 12	13
India-rubber ₱ lb.	35 @ 75	37½@ 90
Iron (American pig)	49 00 @50 00	50 00 @51 00
Iron (English and American refined bar)	125 00@130 00	125 00@130 00
Lead (Am.) ₱ 100 lb.	10 00	10 50
Nails ₱ 100 lb.	8 00	8 00 @ 8 50
Petroleum (crude) ₱ gal.	37 @ 37½	40 @ 41
Beef (mess) ₱ bbl.	11 00 @17 00	11 00 @17 00
Saltpeter ₱ lb.	22	22
Spelter (plates)	10¼@ 10	10¼
Steel (Am. cast) ₱ lb.	13 @ 22	13 @ 22
Sugar (brown) ₱ lb.	13 @ 19	12 @ 17¾
Wool (American Saxony fleece) ₱ lb.	75 @ 77	75 @ 77
Zinc ₱ lb.	15 @ 15	16
Gold	1 46	1 48½
Interest (loans on call)	7	7

The Way to Prevent Boiler Incrustations.

The last number of *Newton's London Journal* has a long article by Lewis Thompson, M. R. C. S., which concludes as follows:—

"A few careful alalyses had convinced us that this incrustation is not due to carbonate of lime, but to sulphate of lime, by which the particles of carbonate of lime are cemented together and converted into a crust. To prevent the formation of this crust, it is necessary only to destroy the sulphate of lime, which is easily done by adding 1 lb. of common carbonate of soda (washerwoman's soda) to every 300 gallons of water supplied to the boiler. This converts the whole of the lime into carbonate, which has no tendency to agglutinate, but remains as a semi-crystalline powder, that may either be collected by placing an empty vessel in the boiler, or it may be blown out at intervals in the form of milky fluid. In both cases the conducting power of the iron boiler is preserved, which not only facilitates the development of steam, but prevents the burning or oxidizement of the boiler. That it must also prevent or diminish the number of explosions is more than probable."

Correspondence

The "Algonquin" and "Winooski" Trial.

Messrs. Editors:—It struck me this morning, on reading your editorial remarks on this trial, page 243 of your last issue, that you could not have reflected on the fact that the Chief of the Bureau of Steam Enginery had pronounced the use of steam expansively as used by the following firms to be a delusion, viz: Maudslay & Sons, John Penn & Sons, Randolph & Elder, R. Napier & Son, Rowan & Co., and other celebrated European engineers, also the Allaire Works, Novelty Works, Morgan Works, Etna Works, Delamater Works, Messrs. Merrick & Sons on the Atlantic Board, and, in fact, all other prominent engineers in this country, *except when building screw engines for our navy from Mr. Isherwood's designs.*

Now, Mr. Editor, I think when you remember that the cylinders of our screw vessels, planned by Isherwood (which in reality comprised nearly the whole of the non-plated navy), are proportioned in accordance with this gentleman's belief on the expansion question, viz: of such a small size that the steam must follow the piston *seven-tenths* of its stroke, so that the steam the boilers will make can be worked off, you will agree with me, that it is a great point that the truth of Mr. Isherwood's theory has been tested by these trials.

No one will deny but that in the late trial the *Algonquin*, as long as she worked, made as many turns with the same wheel as the *Winooski*, with the same consumption of coal; this being assumed, (although I know the *Algonquin* did much better), as the *Algonquin* cuts off at ·11 and the *Winooski* at ·47, according to the previous report of the Board, and the cut-off has not been changed since—in fact, according to her diagrams it is .4—and, as Mr. Isherwood has stated in the summation of his Erie trials, "that if the point of cut-off be lessened to four forty-fifths of the stroke, the loss of the economy in fuel alone reaches the enormous amount of 44 per cent of the cost of the power when cutting off at seven-tenths," (see his report); it is quite clear that these trials, justly incomplete as you stated them to be, have completely overturned the theory on which he has planned the screw navy.

The more so, as the *Algonquin* worked against several drawbacks which did not exist in the much-better constructed engine of the *Winooski;* for it has been calculated that twenty per cent of the water evaporated in the *Algonquin's* boiler passed through her independent circulating engine, and that she lost 50 horse-power by a back pressure of above 3 pounds per square inch more than in the *Winooski's* cylinder; beside, her boilers are not near so efficient in point of economic evaporation as those of her rival, as operated on the late trial. All these losses—losses due to ignorant engineering—the *Algonquin* made up by Nature's law, from which there is no appeal, of the gain by expansion.

Naval Engineer.

[It is astonishing to how small an extent the first principles of investigation are understood. The writer of the above communication is a young engineer of considerable intelligence and capacity, but, in common with the mass of the public who profess no knowledge of steam engines, he swallows these ridiculous experiments of the *Winooski* and *Algonquin* as settling the question of expansion. These experiments are exactly parallel to a series—an account of which was recently forwarded to the Farmer's Club—for testing the value of salt as a fertilizer. They were conducted by a cultivator of more than ordinary intelligence, in a very elaborate manner, and a record was carefully made of the result; but, in every case in which the man applied his salt, he mixed it with guano. This is manifestly absurd, but is no more absurd than trying to settle the value of expansion by working steam in two engines, with the pressure in one at 70 lbs., and in the other at 19.

One of the fundamental principles in making an experiment to test any mooted fact or property is to have the conditions precisely alike in the two trials, except in the point to be tested. It was the perception of this principle that made the investigations of Louis in therapeutics so immeasurably superior to those of all previous observers; that has given their value to the experiments of Fairbairn; and that has stamped with the character of established truth the investigations of Faraday, Henry, Agassiz and all the eminent masters of science. Were it not for the abundant evidence to the contrary, it would seem that this principle ought to be apparent to the common sense of all mankind.—Eds.

Effects of Pure Air.

Messrs. Editors:—When the air is pure we breathe more of it than when impure.

It is often remarked by chemists, that when an attempt is made to breathe carbonic acid gas, undiluted with air, the lungs refuse to receive it. In spite of every effort, the air passages close against it, and if enveloped in it, the person is strangled to death as suddenly as if choked with a halter. When there is as much as ten per cent of this gas in the air the person inhaling it breathes less and less, grows cold, and soon the lamp of life goes gradually out. The more impure the air, the less the person inhales, the more clothing is required, or the more the person suffers from cold. On the contrary, the purer the air the more the person inhales. This fact may also at any time be strikingly shown with my air purifyer. The moment a person who has been for some time confined to the air of the city or village, or been breathing damp, warm air, commences breathing the air that has been properly filtered and purified in this apparatus, he perceives an involuntary heaving of the chest. He inhales almost twice as much air for a few breaths as he did before. So beautifully and wisely have our bodies been constructed and arranged, and so perfectly have the laws of nature been adapted for our good, that when even a little child while asleep begins to inhale the air that has left its impurities in this apparatus, it at once takes several deep, long-drawn breaths. It has been suffering more or less for the want of pure air, it has found it now, and though, asleep, by instinct, greedily devours it and is rapidly purified, stimulated, and strengthened, and its lungs are expanded by it. As it breathed much less when in very impure air, so now it breathes much more. The little chest, that was formerly collapsing gradually, many of the cells in its lungs perhaps closing up, as if for the last time, is now rapidly expanding; those closed cells again opening and enlarging. I have seen not only little ones very low with summer complaint and dysentery placed under its influence and restored in a single night as if by magic, but I have seen the little child with weak, narrow chest, after sleeping under it only three or four months, exhibiting a remarkably large, full, and healthy chest. Its general effects are the same on old or young—it simply purifies, stimulates, and strengthens the whole system and expands the chest, increases the appetite, and improves the health. The best authorities substantiate the truth of the assertion, and no intelligent person who has slept a few nights under this air purifying apparatus, properly supplied, will doubt it that by simply breathing pure air during the hours of repose, families in cities who are now so generally growing weaker and rapidly running out, would rather grow stronger, and not only would there be an immense saving of life, as well as increase in numbers, but the race would be greatly improved physically, mentally, and, other circumstances being the same, even morally, with each succeeding generation. A. S. Lyman.

A Woman's Question.

Messrs. Editors:—As you seem to know a little of everything, will you excuse me if I ask what may seem to you a foolish question?

My husband is not a grumbler, but he says our corned beef is as dry as a chip when it is cold, and I should like to know the reason of it. I put it in cold water as the cook book says, and let it boil slowly and take it out when it is done, but, for all that, I have no luck. Do help me and receive a woman's thanks. Charlotte S.

Hartford, Conn., Nov. 20, 1865.

[Who could withstand such a pathetic appeal as this. The trouble lies with the cook book. It is a false light. The directions are quite wrong. If you put corned beef in cold water it lies an hour in

tepid brine, which is the best possible way to extract all the animal juices, and thus render it insipid. Have your water boiling hot, then, as the beef is cold when put in, it will bring the temperature down, but the outside of the beef will be suddenly shrunk and thus inclose all that is worth retaining. Moreover, you must not take the beef out of the pot when done, but leave it till cold, for in taking it out when hot the moisture evaporates and leaves the beef literally as dry as a chip. Try this plan, and your husband will rise up and call you blessed.—Eds.

Smoke-consuming Stoves.

Messrs. Editors:—A better plan than that suggested by W. H. B., in the Scientific American, would be to have the top of the grate or stove closed as at the bottom, by bars—both top and bottom to be alike—a grated frame on hinges, self-closing, or capable of being securely buckled; the ends of the grate, and sides of the stove to be furnished with something like trunnions, and mounted so as to turn. We have, then, an ordinary grate with back bars and an upper covering, the latter raised, and fastened against the back jam, or, if made detachable, taken off. The fire requires poking and replenishing; this is done in the usual manner by a stratum of fresh coal on the top. The upper part is then closed, and the whole turned bottom upward. By this process, the hottest part of the fire is in immediate contact with the fresh bitumen, from which a dense smoke must pass through and be consumed by the glowing embers, now made the upper portion, with the previous bottom raised, and the surface aglow with an intense flame.

It must be evident to any one accustomed to bituminous coal fires, that combustion would soon pervade the mass below, and when the fire again required renewing, the same process of filling at the top, fastening down the upper grating, turning the whole over on the axial pivots or trunnions, and raising the now upturned bottom could be again repeated, with the result of greatly increased heat and perfect consumption of smoke. The details of adapting this rotary grate or stove it is not necessary to advert to in a communication like this. J. J. W.

Philadelphia, 11th mo., 23d, 1865.

Challenge Accepted.

Messrs. Editors:—In the columns of your valuable paper I find a proposition from H. Van De Water, of Buffalo, N. Y., offering to match his turbine water wheel for the sum of $500 against any patent turbine wheel in the United States.

Now, as I am engaged in the manufacture of a wheel of that class, which I am confident has no equal, I most readily and cheerfully accept the challenge; but, instead of $500, I desire the consideration to be from $1,000 to $5,000, at the option of Mr. Van De Water.

The trial or test of the wheels I desire to be made at Fairmount Water Works, Philadelphia, where there are ample facilities for a most accurate and reliable test. I most cordially accede to the gentleman's request to place the money in your hands or with any responsible party. I would respectfully solicit through your columns an immediate reply.

James Leffel.

Springfield, Ohio, Nov. 20, 1865.

Brass in a Petroleum Lamp Flame.

Messrs. Editors:—Having for a long time subscribed for your valuable sheet, and observed the clear and satisfactory manner in which you have solved many interesting and practical problems, I take the liberty of addressing you for the object of procuring a solution of the mystery involving the principle of the common kerosene lamp. I cannot understand why a thin and peculiar-shaped piece of sheet brass thrust into and over the fiery vein should be so instrumental in producing this mild and beautiful light so universally adopted in our country homes, and of which our city friends are not entirely oblivious. A scientific explanation of this will confer a great favor. D. G.

North Andover Depot, Mass., Nov. 16, 1865.

[Gases, however highly heated, emit very little light, but all solids, when heated to a temperature of about 977°, begin to glow with red light, and, as the temperature rises, the light passes through orange and yellow to white, and rapidly increases in amount. Petroleum is composed of hydrogen and carbon chemically combined. When burned in a lamp, the liquid is first evaporated, then the hydrogen is burned, and, lastly, the carbon. The carbon, on being separated from the hydrogen, takes the solid form, and is intensely heated by the heat generated in the burning of the hydrogen. Nearly all the light comes from this solid carbon in the brief interval after it is highly heated, and before it is burned.

If our correspondent means by "a strip of brass" the cap of the burner, we suppose its office is to confine air near the blaze till it is highly heated, and then to direct this heated air against the ascending petroleum vapor in order to effect complete combustion.—Eds.

To Weld Cast Steel.

Messrs. Editors:—I am a machinist, and have worked for the last twelve years at the business, in this and several other States, and in a number of shops, and have often heard the question of welding two pieces of cast steel together without injury to the steel, or using iron in the process—I refer to large pieces, say from one inch upward—but as yet I have never seen it done, or known it to have been done. My shopmates and myself are very curious to know, and I write to you as the best authority that I know of for information. E. S. Jackson.

Jamestown, N. Y., Nov. 23, 1865.

[Cast steel may be welded as easily as iron by using the following flux: sixteen parts of borax and one of sal ammoniac, melted and kept boiling over a slow fire for one hour, and, when cold, pulverized. The steel must then be heated as hot as you dare without burning, the powder strewed over the scarf, and proceed as with any other weld.—Eds.

Preventive for Boiler Incrustation.

Messrs. Editors:—Reading that useful little French journal, *Le Technologiste*, I noticed an account of experiments on the value of chloride of barium for the prevention and removal of scale from boilers, where it consists principally of the salts of lime. For flue boilers the use of the scaling hammer will be found most economical, but in tubular boilers this substance will often be found of great value, and, for the benefit of your many engine-driving readers, I have deduced the following from the article referred to:—

To ascertain the amount of the chloride of barium required in any boiler, note, when an opportunity offers, the amount to which scale has collected and the time during which the deposit had been gathering; multiply its thickness in sixteenths of an inch by three-sixteenths of the heating surface of the boiler; and this product, multiplied by 1·65, will give the weight in pounds required to be used during a period equal to that during which the scale was collecting, and will be sufficient to prevent further deposit, and gradually to remove that already formed.

As an example, suppose sufficient impurities in the water used in any boiler to deposit one-sixteenth of an inch of scale in six months, the heating surface to amount to 1,000 square feet—

$$1 \times 1{,}000 \times 3\text{-}16 \times 1{\cdot}65 = 309{,}375.$$

Or, supposing one hundred and fifty running days during the six months—about two pounds per day.

As this material has been used very little in the United States, if at all, it is to be hoped that any engineers who may try it will state the result in the columns of your valuable paper.

The druggists inform me that the chloride of barium may be bought now at about thirty cents per pound in quantities of a hundred pounds or more.

R. H. T.

Providence, R. I., Nov. 24, 1865.

[The value of this substance for the purpose indicated, was pointed out many months ago in these columns, but we are obliged for the attention of our correspondent.—Eds.

Faults in Wood-working Tools.

Messrs. Editors:—I have been very much interested in the articles in the Scientific American on tools for the machine shop. I wish some capable person would correct some of the faults in the old wood-working hand tools which are not yet done away with. One fault is in making a basil on the face of chisels and plane irons; for the reason, I suppose, that a kind of an edge can be set a little more quickly. When "Basil Face" uses a chisel he raises it ten degrees or more above the line; and as soon as it begins to cut down goes the handle, then up and down, with the varying direction of the grain, while a true face, moved steadily in the direction of the line to be trimmed, takes a thin, neat shaving, even when cutting in cross-grained places.

I should like to know if any one has a better way for tuning handsaws than to joint straight, set the least that will work freely, and have the teeth all of a size and form—made so by working the file at an angle of about 50° or 60°, for pine, and 30° or 40° for hard wood, down toward the back, and also toward the handle, from a line square across the edge of the saw.

I should like to ask, if thin boilers transmit heat most readily, why do the riveted joints in sheet-iron sugar pans boil first; ebullition can be traced their whole length before the sap boils elsewhere.

E. Alger.

Coos, N. H., Nov. 20, 1865.

Quartz Crusher and Pulverizer.

Messrs. Editors:—In referring to your paper of October 21, 1865, I find a notice of the centrifugal pulverizer of the Boston Milling and Manufacturing Company, clients of mine, who have requested me to call your attention to some errors in your article.

In the first place, please understand that the Milling and Manufacturing Co. make two classes of machines—one of them a crusher and the other a pulverizer. The first acts by percussion—the acquired momentum of their vast fly-wheel, the whirling table, striking the quartz, shivers it into atoms by vibrations set up in the quartz itself, the sides of the case acting simply as a sieve to separate what is fine enough to pulverize from that which needs crushing.

This machine I presume you have seen, and will remember it as very different from the pulverizer. The other class of machine is the pulverizer. This does its work not by percussion or concussion, but by creating vortices of air by the rapid revolution of the paddles, in which the materials, previously crushed by the whirling table to about the size of fine gravel, are set in motion, and, by attrition among the particles, like the stones on the sea shore or the sands of the desert, are reduced to fine dust. Every particle of material pulverized by this machine is rounded, not angular, like crushed work, and by having a central exhaust and current of air blowing through the machine, the light particles of dust are blown out, while the larger gravelly and sandy material remains under the action of the whirls of air generated by the beaters or fans, and continues to grind itself to powder. Experience shows us that the finer the material fed, the better yield of flour we have, and the lighter can be the machinery. The only reason at present for making the paddles so heavy and strong is to avoid danger from extraneous substances getting into the machine. An ordinary fan blower will do the work, if by no accident broken by substances too large getting into the cylinder in which it revolves. It is the improvement in principle that has rendered this successful, not merely the use of Franklinite, although that is very valuable in crushers and for any wearing parts.

By making the correction indicated you will much oblige Thos. Wm. Clarke.

Boston, Mass., Nov. 24, 1865.

Spiral Blower.

Messrs. Editors:—Allow me to ask, through your paper, if a turbine water wheel would be suitable to force air when driven at the necessary speed?

J. S., an English subscriber.

London, 9 Shanran Place, Maida Vale, W., Nov. 11, 1865.

[Spiral blowers will force a current of air against a moderate pressure; but, for any considerable pressure, no substitute has yet been found for the piston air pump. Several years ago a man in this country conceived the idea of making a pump for water by hanging a screw in a pipe, but, when the screw was made to revolve with high velocity, the water, instead of being forced along in a continuous current, was beaten into foam.—Eds.

EMERSON'S SAW TOOTH.

This engraving represents a plan for securing false teeth in circular saws—called false teeth in distinction to those worked solid on the saw, in the usual manner. It is not claimed that the idea of so fastening teeth in saws is novel, but that the plan itself is a valuable improvement.

It will be seen, on examining the engraving, that the tooth, A, is curved in form, and that it is grooved on the back, as at B. In this shape it is fitted to its seat in the saw, which is adapted to receive it, as will be perceived on inspection. When once placed it is fastened by a rivet, C, one half of which is in the tooth, and the other half in the saw, where it is firmly held. It is claimed that this method of construction prevents the teeth from ever becoming

loose, for the reason that the action of them on the wood being sawed tends to bind them firmly in place, and that the greater the resistance the stiffer they become. The beveled edge of the seat on the saw prevents the tooth from slipping sidewise, as may be seen.

It is also claimed that the teeth are easier to fit in place than by some other methods, and do not injure the saw itself by buckling or expanding it, as is done when the teeth are driven in forcibly. The concave side of the teeth are made thicker than the opposite, or convex side, forming, as the inventor says, a dust chamber, so that no saw dust is allowed to pass the tooth and clog or pack against the timber and heat the saw when in use, but is all carried through the timber and discharged below.

The inventor claims for his improvement the following advantages:—The teeth are forged from the best cast steel, and, therefore, are better material than the saw plates; they can be removed and new ones inserted very readily; they increase the size of the saw; they require no setting, and run with less power than common teeth, and can be more easily kept in order; the liability of breaking and springing or straining the saw by gumming is avoided, as these teeth are not so treated; only one half the number of teeth are required, and these cut smoother and are not so liable to heat when in use as the ordinary one.

Parties can be furnished with these teeth by Emerson & Silver, of Trenton, N. J., where they can be seen in use. Descriptive circulars will be sent to any address.

The patent for this invention was obtained through the Scientific American Patent Agency, on September 12, 1865, by J. E. Emerson; for further information address as above.

RAISING OF A WRECK.

We published last week a description of the steamer *Saxon* and her submarine apparatus. Since that was written, the steamer has had an opportunity to try her powers practically, in saving a wreck, and with the most brilliant success. We are informed by Mr. Macdonough, the President of the Company, that the *Saxon* sailed from this port in the afternoon of Tuesday, the 14th inst., for the great harvest ground of wrecks, Key West, Fla.; and the next day, Wednesday, while on her way down the coast, she discovered the rail of a vessel just above the surface of the water. Proceeding to the wreck, Capt. Holbrook perceived that it was a schooner, capsized and nearly sunk. As the weather was threatening he made fast to the wreck and towed her into the Lewes, inside the Delaware breakwater, where he could conduct the operation of raising her in still water.

Two of the india-rubber bags were lashed together and passed under the keel near the bow, and two others near the stern; these bags being connected by hose with the reservoir of compressed air on the steamer. When all was ready the stop cocks were opened, allowing the compressed air to flow into, and inflate the bags. In five minutes the schooner's deck was above the surface, and she was on an even keel. She proved to be the schooner *Damon*, of Waldoboro, Me., loaded with live oak plank, an A2 vessel of 200 tuns burden. She was taken to Philadelphia, and drawn up on the ways; on examination, her hull proved to be very little injured.

By the old process of raising wrecks, two canal boats would have been placed, one on each side of the schooner; they would have been sunk to the water's edge, and lashed together by chains passing under the schooner's keel; and then the water would have been pumped out of them—a process occupying three or four days. The salvage from the *Damon* will probably pay the expenses of the *Saxon* for two months or more.

IMPROVED CURRENT WATER WHEEL.

Le Pays, of Paris, says that crowds of Parisians are gazing with curiosity upon a strange-looking craft that is anchored in the Seine; and our cotemporary devotes four columns to a description of the novelty. It is an apparatus for utilizing the power of the current for driving machinery. A vessel is anchored in the stream, and a long, endless chain, passing over a drum, carries a series of floats, which pass down stream submerged, and return above water. The floats are made about 16 feet long and 2 feet wide, and they are attached to the chain at intervals of about 6 feet. The writer estimates that with 70 of these floats and a current of 2 miles per hour, 10 or 12 horse-power may be obtained. The plan was conceived in 1821 by M. Roman, a mechanic of Beaucaire; he has recently obtained patents for it, and a wealthy company has been organized to carry it into practical use.

Magnesium.

M. Bultinck, of Ostend, proposes the substitution of magneseum for zinc in voltaic circles.

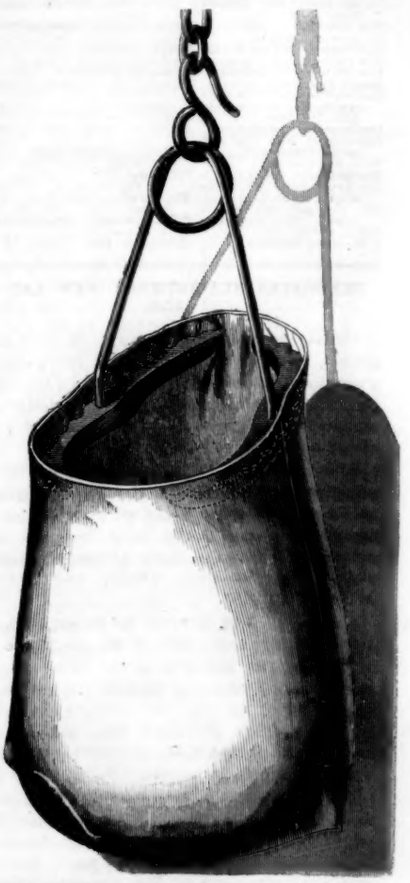
Take a piece of copper and a piece of zinc wire of the same size, fix them in a cork at a little distance from each other, attach fine copper wire to the upper end of each piece of metal, and connect the little battery with a delicate galvanometer. Float the cork containing the metal wires in a glass of distilled water, and the needle of the galvanometer will be deflected thirty degrees, finally resting at a deviation of ten degrees in five minutes. Substitute wires of silver and magnesium of precisely the same size for those of copper and zinc, and connect them with the galvanometer as before. The needle is now deflected ninety degrees, and rests at twenty-eight degrees. These comparative experiments show a difference of nearly sixty degrees in favor of magnesium and silver over zinc and copper.

M. Bultinck made a chain similar to Pulvermacher's, of twenty elements of magnesium and silver wire, and this, plunged in pure water only, gave chemical, physical, and physiological effects equal to those made of zinc and copper, excited by salt or acidulated water.—*British Journal of Photography.*

REYNOLDS'S BAG HOLDER.

Not to "know beans when the bag was open," used to be a term of reproach applied to youths with thick skulls and somnolent propensities. In some cases this was unjust, for, of old, bags were not held open, and it would take a good prophet to tell what was in them without previous knowledge.

The bag holders in use at the present time have



proved very handy, and that here shown seems to be a capital one. It consists of a single wire, A, bent so as to form a spring, and provided at the ends with metallic arms, B, which distend the bag, as shown; indeed, the artist has left us but little to do by way of description, so clearly are all parts, and the uses of them, shown.

This holder is to be suspended from any convenient point, and is quickly taken out and put in another bag. It is only necessary to grasp the two wires with the hand, when the arms are drawn together, and the bag is released.

A patent was issued through the Scientific American Patent Agency, on Nov. 28, 1865, to E. Reynolds, of Corunna, Mich.; address him at that place for further information.

GLUE IMPERVIOUS TO WATER.—If a coating of glue or size be brushed over with a decoction of 1 part of powdered nutgalls in 12 of water, reduced to 8 parts, and strained, it becomes hard and solid. It makes a good coat for ceilings to whitewash on, and for lining walls for paper hangings.

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NEW YORK, SATURDAY, DECEMBER 9, 1865.

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THE DIFFERENCE BETWEEN NEW AND OLD ALE.

Ale may be strong in two ways—in hops and in alcohol. Ale is simply water, with the addition of a very small proportion of alcohol and a still smaller proportion of the extract of hops. The bitterness is imparted by the hops—the stimulating and intoxicating properties by the alcohol.

When ale grows sour with age, the sourness results from the change of alcohol into vinegar; the beverage is, therefore, weakened in proportion as it becomes sour—the alcohol being destroyed in the production of vinegar. If the process is completed, the liquid becomes water, vinegar, and the extract of hops.

Ale may be kept, however, for a long time, without becoming sour; and when not made sour by keeping, its strength is not impaired. Both vinegar and alcohol are composed of carbon, hydrogen, and oxygen, but vinegar contains a larger proportion of oxygen than alcohol. Alcohol, therefore, cannot be converted into vinegar without a supply of oxygen. Water, which is the principal ingredient in ale, is nearly all oxygen, but alcohol has not the power of decomposing water, and appropriating its oxygen, a supply, therefore, in order for the conversion to take place, must come from some other source. This source is usually the atmosphere, one-fifth part of which, by volume, is pure oxygen. Besides the oxygen which water contains as its largest constituent element, it absorbs other oxygen from the atmosphere, and holds it, in a free or uncombined state, in solution. It is this free oxygen which enters into chemical combination with alcohol when that liquid is converted into vinegar. As the quantity thus absorbed is small, the conversion soon ceases, unless the ale can absorb further quantities from the atmosphere. The simple plan, therefore, for preventing ale from becoming sour and weak is to inclose it in air-tight vessels. A large proportion of alcohol also checks the ascetic fermentation, consequently strong ales keep better than those that are weak.

When bottled in the proper stage of fermentation, ale is not only preserved in strength and flavor, but its effervescence is increased. The foam of ale is formed of innumerable globules of carbonic acid gas, each inclosed in a minute film of the slightly viscid liquid. In the fermentation of barley or other grain, the starch, which is the largest constituent of the grain, is changed first into sugar, and then the sugar is changed into alcohol and carbonic acid. To make ale very foaming it is bottled before the vinous fermentation is quite completed, and then it becomes saturated with a large quantity of carbonic acid.

Hops are put into ale to give it a bitter taste, and they are also supposed to possess narcotic and anodyne properties; but there is a difference of opinion on this point. Wagner and Bibra made a series of experiments on the lower animals with the oil of hops, and came to the conclusion that it had no narcotic properties.

ACQUIRING INFORMATION.

Many persons, whose opportunities for information have been few, appreciate late in life the advantages of education, and endeavor to acquire information of a useful character by a course of study.

Mechanics who have felt the need of more precise and thorough knowledge of arithmetic or other branch of mathematics; manufacturers, who wish to be grounded in the rudiments, at least, of chemistry; shopmen who wish to become bookkeepers; men of these and other callings often conceive and carry out the laudable object of learning something in the long winter evenings, that shall be of lasting benefit.

Too often, however, all their efforts are wasted by beginning improperly. In order to render time spent in study useful, some system must be pursued, so that instead of receiving a mere general impression of any process, or science, the student will have a clear and thorough knowledge of it, and so be able to suggest improvement or perceive defects.

It often happens that valuable inventions are made in this way by men who are not members of the profession or line of business to which their discovery belongs. Instead, therefore, of having a mere smattering of many subjects, it is far better to be able to talk rationally on one. Ignorance of all things, in these days of printing presses, is justly held in contempt; but if a man knows something thoroughly, no one can accuse him of ignorance. The grand mistake most persons make, in taking up any branch of study, is in trying to learn too much at once.

Instead of setting down soberly *to work*, and reading one chapter or one page, even, it is common for many to rush through a work, reading at random. The consequence is that they have no knowledge of the matter, and feel that they have not; for when, afterward, they attempt to recall some of it, they realize the effects of desultory reading.

It is, moreover, very discouraging to find memory so treacherous, for the student imagines that he has some mental defects which prevents him from acquiring knowledge as other men, when the fault is not of this nature, but one of method.

Men who work at trades experience difficulty in settling their minds to habits of study at first, just as those whose fingers are stiffened by clasping a hammer find their joints are not so flexible as a writing master's. But by practice and discipline mental dexterity comes as surely as manual skill.

Let no one feel disheartened if, at the outset, he finds his mind a blank after an evening's study. Stick to the task, and read the chapter over again until it is mastered, but do not expect to plunge at a bound into the mysteries of mathematics, or chemistry, or other laws governing the action of the imponderable agents—such as light, heat, electricity, and others. Be content with moderate but sure gains, and there will be no disappointing, but certain reward.

INVENTOR'S ASSOCIATIONS AND THE PATENT LAWS.

All life is a battle. Malthus pointed out the truth that the human race is constantly pressing on the means of subsistence so vigorously that only a favored few live out half their days; Darwin has shown that the same struggle for existence is going on throughout the whole animal creation; and Carlyle, in his shadowy and extravagant style, failed to express the truth that he perceived, by the remark, "The very hyssop on the wall grows there because the whole universe can not prevent it." Even with all the appliances of modern mechanism, more than three-quarters of mankind are obliged to pass through life with a large portion of their wants unsatisfied. Though the production of wealth is a hundred-fold greater than in any previous age of the world, it is still far short of the desire for wealth. In this state of affairs, it is not strange that every one is struggling to get as large a share as possible of the limited product.

All men place an exaggerated estimate upon their own abilities and services. Punch, with correct knowledge of human nature, asks, "Did you ever know a man who was satisfied with his position, or dissatisfied with his talents?" If the wealth that is produced in the world should be distributed arbitrarily by any human tribunal—however exalted in intelligence and virtue, and however highly respected—every one would feel that he had received less than his rightful proportion, and all would complain of the injustice of the distribution. On the other hand, when every man is left free to get all the property that he can by the employment of his own faculties, though he may feel that he has less than his due share, there is no human tribunal responsible for the distribution that he can reproach with injustice. He submits to the evil as an irresistible decree of Providence; or, if his judgment be enlightened and just, as the natural consequence of his own conduct. The smallness of his share he may regard as a grief, but not as a grievance.

The most admirable feature of the patent laws is, that in their rewards for inventions they conform to the laws of nature. They give the inventor the exclusive right to his invention for a limited period, and then they leave him to get out of it all he can. If the invention is valuable, and he knows how to manage it, he makes a fortune out of it. If it is equally valuable, and he does not know how to manage it, he makes nothing out of it. In this case, however, he has no one to blame but himself.

If a number of inventors should put all their inventions into a joint-stock association, with the understanding that the gross proceeds should be distributed fairly among them, it requires no profound knowledge of human nature to perceive that the distribution would be unsatisfactory to all the members. Each one would consider himself the greatest genius in the company, and his invention the most valuable invention of any. As a general rule, the more stupid the inventor, and the more worthless his plans, the more lofty would be his estimate of both. Associations are admirable things when organized in accordance with common sense, but an association of inventors like this would be doomed to a squabbling and brief career. Inventors, being usually sensible men, rarely ever get entangled in such associations.

AN EXCURSION TO THE COAL FIELDS.

A very pleasant excursion over the Reading and Lehigh Valley Railroads was enjoyed by a party of about thirty gentlemen during the past week. It continued four days, and was an occasion which all the participants must ever remember with pleasure.

The entertainment provided throughout the excursion was a continual feast. The exhaustless coal fields and iron beds of the Schuylkill and Lehigh Valleys, through which the party traversed, afforded a fine opportunity to witness the wonderful mining operations carried on in those regions of Pennsylvania. To C. E. Smith, Esq., President of the Reading Railroad, and Mr. Langstreth, of the Lehigh Valley Railroad, the excursionists were under special obligations for courteous attentions.

Among the most prominent guests were Hon. John Sherman, of Ohio, chairman of the Senate Finance Committee; David A. Wells, of New York City, and Stephen Caldwell, of Philadelphia, members of the Revenue Commission; General Simon Cameron, ex-Secretary of War; and John Tucker, late Assistant Secretary of War; T. W. Olcott, of Albany; Morton McMichael, proprietor of the *North American* and Mayor-elect of Philadelphia; Moses Taylor, of New York; Judge Strong, of Reading; Dawson Coleman, of Lebanon, and about twenty other prominent business and literary men from New York and Philadelphia, many of whom have large pecuniary interests in the coal and iron mining districts through which they passed.

On some future occasion we hope to have time and space to tell our readers some things we saw at the coal fields, in the furnaces, rolling mills, machine shops, and zinc works which we visited during this excursion.

ISSUED FROM THE UNITED STATES PATENT-OFFICE

FOR THE WEEK ENDING NOVEMBER 28, 1865.

Reported Officially for the Scientific American.

☞ Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

51,126.—Saw-mill.—Emanuel Andrews, Williamsport, Pa.:

I claim the construction and use of the plates, E E', adapted to be readily connected and disconnected with the saw, substantially in the manner and for the purposes herein set forth.

Second, I claim the dovetailed ends, a' a2, on the saw, a, adapted for use in combination with detachable plates, E, or their equivalents, and the buttons, D, or equivalent stops, arranged substantially in the manner and for the purposes herein set forth.

Third, I claim the projecting ends, F F, projecting beyond the cleats at the top or bottom of saws, or their attachments, so arranged as to allow any suitable gage rods to be applied on the ends, substantially as herein described and for the purposes set forth.

51,127.—Broom.—Jerome and Gilbert Bacon, Medina, Wis.:

I claim the broom, constructed as described, as a new article of manufacture; that is to say, with the splints or broom corn secured in the conical sheath or cap by glue around their buts, among which the pointed end of the handle is driven, securing by the aid of the glue and the fastening, a, all the portions in their relative positions.

51,128.—Apparatus for Carbureting Air.—Dana Bickford, Boston, Mass.:

I claim my improved air-forcing apparatus, as composed not only of the close vessel, A, provided with a cover, G, and a stuffing-box, d, but of the bell-shaped vessel or cup, c', its tube, D, and valves, E and F, arranged in manner and so as to operate as specified.

51,129.—Hydraulic Elevator.—Dana Bickford, Boston, Mass.:

I claim the cylinders, A, the frame, b, the rods, a, the platform, E, the valve chest, E', and guides, c, or their equivalents, all arranged and operated as and for the purposes described, and set forth in the foregoing descriptions.

51,130.—Apparatus for Cooling Soda Water, Etc.—Edmund Bigelow, Springfield, Mass.:

I claim the vertical cooling vessels, A A A, connected by pipes, C C, near their upper ends, and by air pipes, D D, at top, in the described combination with the supply cock, B, escape cock, G, and the draught tube, E, extending nearly to the bottom of one of the cooling vessels, the whole being arranged substantially as herein described, so as to operate in the manner set forth.

51,131.—Venetian Blind for Windows.—Charles D. Blinn, Port Huron, Wis.:

I claim, First, Connecting the slats to each other by means of cords, L, rove through them, and fastened below each slat by means of knotting said cords, substantially as above shown and described.

Second, I also claim, in combination, the cords, L, rove throgh the blinds and connected to them as shown, and the cords, D D J I, applied substantially as shown.

[This invention in venetian blinds consists in the manner of roving the cord that supports and connects the several slats to each other; and, also, in the manner of operating the blind both in raising it and in opening and closing the slats.]

51,132.—Chair Bottom and Back.—William Bramhill, New York City:

I claim the employment of perforated, elastic, vulcanized india-rubber or india-rubber cloth, substantially as herein described, in the bottoms and backs of chairs and other articles of furniture for sitting and recumbent purposes.

51,133.—Tool for Squaring the Ends of Shafting.—Levi Bronson, Buffalo, N. Y.:

I claim, in combination with the tool stock described, the dog, C, cutter, F, and drill, B, all for the purposes substantially as herein set forth.

51,134.—Friction Clutch.—Wm. H. Brown, Worcester, Mass.:

I claim, First, The combination of the detached, elastic segments with the wedge blocks, substantially as and for the purpose described.

Second, I claim making the wedges which force the segments against the rim of the pulley the medium of coupling it with the core.

Third, I claim the combination of the sleeve, E, the links and toggle joints with their terminal wedges, and the expanding segments or ring, substantially as described.

Fourth, I claim the combination of the links, I I, with the toggles, J J, substantially as and for the purpose described.

51,135.—Locomotive Head Lamp.—Peter Budenback, New York City:

I claim, First, The described arrangement of the double, conical, foraminous cage or guard, f, surrounding the mouth of the supply tube, e, in the described relation to the reservoir and burner, for the purposes specified,

Second, The plurality of supporting rings, k k, attached by arms to the button rod, j, and disconnected from the draught tube when combined and arranged in relation to the various parts of the lamp burner, in the manner and for the purposes set forth.

51,136.—Tube and Pump for Wells.—James H. Bump, Unadilla, N Y.:

I claim, First, In wells which are made by driving the ends of tubes into the ground, inclosing a cylinder or pump barrel having a conical, perforated end, within an outer tube driven or placed in the ground, and connecting them by a water-tight joint, by means of a contraction in the outer pipe, substantially as shown.

Second, I also claim making a flange or its equivalent on the inside of the pump barrel or cylinder so that the cylinder can be removed by the jar of the piston against it, substantially as described

51,137.—Suspenders.—Edwin Burgess, Racine, Wis.:

I claim suspenders having a yoke, and vertical and inclined parts united by a single buckle, all substantially as described.

51,138.—Drill and Reamer for Oil or other Wells.—James Burnes, Titusville, Pa.:

I claim, First, In drills for boring oil and other wells, placing one cutting edge across the drill, but on one side of its diameter, and another cutting edge on a radial line at a right angle or other angle to the other cutter, substantially as shown, the last-mentioned cutter being equal in length to the radius of the bore.

Second, I also claim in combination with cutting surfaces arranged as stated in the first clause of the claim, the reamer, D, constructed and arranged on the drill, substantially as described.

[The object of this invention is to produce a drill which shall bore a round hole as well by reason of the position of its cutting edges in relation to each other as by reason of the reamer which constitutes a part of the tool.]

51,139.—Coal Scuttle.—Marcus L. Byrn, New York City:

I claim as a new article of manufacture the scuttle for coal, etc., formed in the manner specified.

51,140.—Cotton Bale Raft.—Thomas Byrne, New York City:

I claim the mode substantially as herein described of rafting cotton bales and other baled or bundled merchandise, of a buoyant character upon rivers, the said mode comprising a frame or platform for a series of bales or bundles, and a water-proof covering applied under the bottom, around the sides and ends and partly wholly over the top of the raft of bales or bundles, as described and represented.

51,141.—Bottle.—Charles W. Cahoon, Portland, Maine.

I claim a bottle consisting of a hollow block of wood, and fitted with a stopper rendered impermeable to liquids, with either of the substances specified or their equivalents.

51,142.—Bottle.—Charles W. Cahoon, Portland, Maine:

I claim an impermeable wooden bottle, having a plug, substantially as described.

I also claim the said bottle, having a channel substantially as described

I also claim an impermeable wooden bottle having covers, substantially as described.

51,143.—Coal Stove.—Luther W. Campbell, Aurora, Ill.:

I claim the fire box for a stove containing the flues, u, cap, W parts, M, as set forth

51,144.—Connector for Carbon Batteries.—Charles T. F. Chester, Hackensack Township, N. J.

First, I claim attaching the platina on the plate, button or connecting surface by spinning the platina on and over the edge of the plate or button as set forth.

Second, I claim the application of a centering hole on the opposite side of the plate or button, that the binding screw may always find the center and bring the platina surface firmly in contact with the carbon plate, or its equivalent.

51,145.—Pump Filter.—John Christman, Syracuse, N. Y.:

I claim a pump filter composed of the parts, A B and C, substantially as and for the purposes described.

51,146.—Suspender Pocket.—John F. Clark, Baltimore, Md.:

I claim the addition to the common suspenders of a guard or cover for the front straps thereof, in the manner and for the purposes substantially as set forth.

I also claim attaching a guard to suspenders having a pocket for a watch or money, substantially as set forth.

51,147.—Neck Yoke.—Ambrose B. Coleman, Lyndonville, N. Y.:

I claim the whole of the draught neck yoke, as herein described in this specification and description, in the manner substantially as and for the purposes set forth.

51,148.—Deep-well Pump.—John J. G. Collins, Philadelphia, Pa.:

I claim, in combination with a hollow pump rod, for operating valves or plungers for raising oil as herein represented, the opening from the exterior of the pump tube to said hollow pump rod and through it to the exterior of the pump for the purpose of also, by the same operation, pumping out the gas from the well, substantially as described.

51,149.—Clothes Rack.—Cyrus B. Crosby, Cortlandville, N. Y.:

I claim the arrangement of the staff, a, the sockets and balls, b, with projections, c, the arms, d, and bars, f, operating substantially as and for the purpose specified.

51,150.—Machine for Making Needles.—C. O. Crosby, New Haven, Conn.:

First, I claim the combination of the feeding device, D, with the carrier, H, constructed to receive the wires, substantially as described, and having an intermittent progressive movement, as and for the purpose specified.

Second, The carrier, H, having an intermittent progressive movement in combination with flattening dies, A, substantially as and for the purpose specified.

Third, The carrier, H, having an intermittent progressive movement, in combination with growing dies, A2, substantially as and for the purpose specified.

Fourth, The carrier, H, having an intermittent progressive movement in combination with counter-sinking dies, A3, substantially as and for the purpose specified.

Fifth, The carrier, H, having an intermittent progressive movement, in combination with eye-punching dies, A4, substantially as and for the purpose specified.

Sixth, The carrier, H, having an intermittent progressive movement, in combination with the trimming dies, A5, substantially as and for the purpose specified.

Seventh, The carrier, H, having an intermittent progressive movement, in combination with the flattening and grooving dies, A1 and A2, substantially as and for the purpose specified.

Eighth, The carrier, H, having an intermittent progressive movement, in combination with flattening, grooving, and counter sinking dies, A1 A2 A3, substantially as and for the purpose specified.

Ninth, The carrier, H, having an intermittent progressive movement, in combination with flattening, grooving, counter-sinking, and eye-punching dies, A1 A2 A3 A4, substantially as and for the purpose specified.

Tenth, The carrier, H, having an intermittent progressive movement, in combination in flattening, grooving, counter-sinking, eye-punching, and trimming dies, A1 A2 A3 A4 A5, substantially as and for the purpose specified.

Eleventh, The carrier, H having an intermittent progressive movement, in combinhtion with grooving, counter-sinking, eye-punching, and trimming dies, A2 A3 A4 A5, substantially as and for the purpose specified.

Twelfth, The carrier, H, having an intermittent progressive, movement, in combination with counter-sinking, eye-punching, and trimming dies, A3 A4 A5, substantially as and for the purpose specified.

Thirteenth, The carrier, H, having an intermittent progressive movement, in combination with eye-punching and trimming dies, A4 A5, substantially as and for the purpose specified.

Fourteenth, The carrier, H, having an intermittent progressive movement, in combination with one or more finishing mills, m m n, buffs or burnishing mills or their equivalents, as and for the purpose specified.

Fifteenth, The carrier, H, having an intermittent progressive movement, in combination with a carrier, H', provided with revolving spindles, p', and having an intermittent progressive movement, substantially as and for the purpose specified.

Sixteenth, The combination of the cone, F3, or its equivalents, with the spindles, F1, substantially as and for the purpose specified.

Seventeenth, The combination of the cone, F3, with the carrier, H, provided with revolving spindles, and having an intermittent progressive movement, substantially as and for the purpose specified.

Eighteenth, The direct combination of revolving spindles, P', with one or more intermittent hammers, T3, and one or more grinding, filing, polishing, or burnishing wheels, arranged substantially as and for the purpose specified.

Nineteenth, The improved organized automatic or self-acting machine, constructed substantially as herein described, so as to feed and present the wire to the several instruments for their action, and discharge the needles completely formed.

51,151.—Bridle Bit.—Edmund Day, West Springfield, Mass.:

I claim as a new article of manufacture a bridle bit composed of metal covered with hard vulcanized gum, substantially as herein described.

51,152.—Lock.—Alonzo E. Deitz, Brooklyn, N. Y.:

First, I claim the combination of the separate tubes C E and G, the separate sets of pins, or tumblers, D D and F F, and the eccentric pins, i i, all arranged and operating substantially as and for the purposes set forth.

Second, The plates, g g, at the inner ends of the tubes, C E, in connection with the grooves, h, made circumferentially in the pins, D F, substantially as and for the purpose specified.

Third, Having the outer part of the pins, F, diminished or reduced in diameter and eccentric with the main portions, substantially as and for the purpose set forth.

51,153.—Splint Plane.—James Dempsey, Richmond, Ind.:

First, I claim constructing bit, C, of a splint plane, with the slot and spring, substantially as described.

Second, The arrangement of the spring, D, clamps, E, screw, M, stock, A B, with the bit, C, all of them constructed and operating substantially as and for the purpose described.

51,154.—Ointment.—William Dony, Honesdale, Pa.:

I claim the within-described composition for ointment, made of the ingredients above specified, and mixed in about the proportion and substantially in the manner set forth.

51,155.—Skate.—Francis E. Drake, Chicopee, Mass.:

I claim inserting a web in a groove in the runner of a skate and fastening them firmly together, substantially in the manner and for the purpose described.

51,156.—Process for Distilling Petroleum.—Aristide Dubreuil, Baltimore, Md.:

I claim the use of heavy petroleum, tar of petroleum, mineral or vegetable oils, grease, metals easily fusible, or an other substance within the boiler, inside the retort or still, to vaporize the material known as petroleum or rock oil, substantially in the manner and for the purposes herein before shown and described.

51,157.—Sewing Machine.—Henry Dunham, Jr., Abington, Mass.:

I claim the combination of the awl, needle, feeder, and a presser, having its foot so constructed and applied as to be capable of operating with forward and backward motions, in the direction of the movement of the leather or material while in the act of being sewed, the whole being substantially as described and represented.

51,158.—Air Brake for Cars.—Lucius H. Dwelley, Dorchester, Mass.:

I claim saving the power employed in stopping or checking the motion of a car or other vehicle, and employing the same in starting it.

I also claim forcing air into a receiver by a suitable pump or air engine, operated by the wheels or axle of a car or other vehicle, the compressed air acting through suitable mechanism as a brake on the wheels.

I also claim compressing air in a suitable receiver during the operation of stopping or checking the motion of a car or other vehicle, and utilizing the expansive power of the air for the purpose of starting or driving it.

I also claim as an improvement in atmospheric brakes for railway cars and other vehicles, an air engine or pump operated by the wheels or axle of a car or other vehicle, in combination with an air receiver, substantially as set forth.

51,159.—Manufacture of Vinegar.—Haldah Eckert, Lodi, Wis.:

I claim converting water in which potatoes have been boiled into vinegar, substantially as described.

51,160.—Ice-cream Freezer.—Albert W. Edwards, Mendota, Ill.:

I claim the combination of a cream holder rotating in one direction with two sets of beaters rotating therein in the opposite direction, when the beaters are so disposed that one set creates a central upward current, and the other outer downward currents, substantially as set forth.

I also claim, in combination with a rotating cream holder, a rotating scraper having a movement in the same direction with the cream holder, but at a different speed.

51,161.—Mode of Making Binding for India-rubber Fabrics.—Charles A. Ensign, Naugatuck, Conn.:

I claim the employment of the groove plate, b, substantially as described and for the purpose set forth.

I also claim the employment of the roller, f, or its equivalent, in combination with the plate, b, substantially as and for the purpose described.

51,162.—Method of Delivering Mails and Packages from Railroad Cars while in Motion.—Chas. D. Everett, Cleveland, Ohio:

First, I claim delivering mail bags, packages, etc., from railroad cars when in motion, automatically, substantially as set forth.

Second, I claim the adjustable lever hook, D D', hanger, C, and arm, A, or their equivalents, when arranged and operating substantially as and for the purpose specified.

51,163.—Harvester.—G. C. Fanckboner, Schoolcraft, Mich.:

I claim the herein-described combination and arrangement of the bar, C, arms, D D' bar, F, and standard, G, for joint operation, as and for the purpose herein described.

51,164.—Apparatus for Cooking, Washing, Etc.—Samuel S. Fitch, New York City:

I claim the combination with the steam-tight boiler, B, of the can or cans, C, therein, for containing the food or other matter under treatment, substantially as and for the purpose described.

51,165.—Rotary Steam Engine.—Matthew Fletcher, Louisville, Ky.:

First, I claim the double cylinders described.

Second, The internal cylinder so arranged with reference to the flyers or pistons as to have a rotary motion, nearly corresponding with them, and so as to rotate within the outer cylinder, substantially as shown and described.

Third, The hollow rings or chambers placed within the cylinder heads, for the purpose of equalizing the pressure on the ends of the pistons, substantially as shown and described.

Fourth, The devices for keeping the flyers or pistons against the sides of cylinder, although the distance of the outside of flyers one from the other differ in their revolution as described, and the whole arranged substantially in the manner and for the purpose set forth.

51,166.—Revolving-cylinder Engine.—Joseph S. Foster, Virginia, Nevada:

I claim the fly wheel, A, with two rigidly attached cylinders, D D', placed opposite each other in a radial direction, having a common piston rod, F, attached at the center to a crank pin, a, in such a manner that every revolution of the fly wheel caused by the action of steam in the cylinders produces two revolutions of the crank, substantially in the manner as herein set forth.

I further claim the stationary disk valve, I, with ports, d d', and grooves, f f', in combination with the revolving fly wheel, A, carrying the cylinders, D D', and pipes or channels, c c', in the manner and for the purpose substantially as herein described.

[An engraving and full description of this invention will be found on page 35, Vol. XIII., SCIENTIFIC AMERICAN.]

51,167.—Packing Deep Wells.—A. H. Fowler and E. J. Morgan, Ithaca, N. Y.:

We claim packing the tube of a well by means of a compressible packing, D, applied between the wall and the tube, said packing being compressible by the adjustment of the nut and washer, or their equivalents, on the threaded tube, substantially as described.

51,168.—Mode of Sharpening Saws.—Chas. P. Frazer, Allowaystown, N. J.:

I claim, First, The combination of the concentric clamps, B and C, with the bed plate, A, for holding a saw in position to be filed, substantially as herein described.

Second, The combination of the sliding bar, D, with the file, E, the reversible swivel, G, and fingers, H and H', the whole being constructed and arranged in relation to each other, and to the bed plate, A, and clamps, B and C, substantially as and for the purpose set forth.

51,169.—Malt Kiln.—Joseph Gecmen, Chicago, Ill.:

First, I claim the combination and arrangement of the inner perforated cylinder, a, the adjustable diaphragm, m, and the perforated cylinder, b, arranged substantially as specified and shown.

Second, I claim providing the inner cylinder, a, with the adjustable conical diaphragm, m, arranged and operating as specified and described.

Third, I claim the arrangement of the perforated annular slide, o, with the cylinder, b, substantially as and for the purposes specified.

Fourth, I claim the combination of the inverted close chamber, e, with the perforated cylinder, a, arranged and operating substantially as and for the purposes specified and shown.

Fifth, In combination with a malt kiln constructed substantially

as described, I claim the employment of the hot-air tubes, f h, provided with valves, f j, arranged as shown and specified and for the purposes described.

51,170.—Gas Burner for Cooking Purposes.—Adolph Geiss, Buffalo, N. Y.:

I claim the draught and mixing chamber, A, in combination and arrangement with the perforated dome, D, perforated shell, E', metallic base, A2, including gas pipe, F, for the purposes as described.

51,171.—Machine for Winding Yarn for Weaving Tape.—J. Gibbs, Warren, Mass.:

I claim, First, Rewinding the sized yarn from beam, C, upon a series of narrow and independent yarn beams, I, by a series of friction wheels, F, as and for the purposes stated.

Second, The combination of the self-adjusting arms, d d, and friction wheels or drums, F, with the beams, I, substantially as and for the purposes set forth.

51,172.—Hat.—D. W. Gitchell, New York City:

I claim applying a metallic or other spring, formed in the shape of a ring around the body of a hat along its joint, substantially as and for the purpose described.

51,173.—Bit Stock.—D. W. Goodell, Northampton, Mass.:

I claim the combination of one or more pieces, A B, etc., with one or more pieces, E F, etc., spring, L, cap, K, and stock, P, when arranged substantially in the manner and for the purpose herein set forth.

51,174.—Capstan.—William Dakin Grimshaw, New York City:

I claim the socket, k, and spring pawls, l, in combination with the gear wheels, g and h, and capstan, c, substantially as specified, whereby a separate pawl bed and pawls are dispensed with, as set forth.

51,175.—Pneumatic Pump.—Wm. H. Guild, Williamsburgh, N. Y.:

First, I claim the arrangement of the main air-induction chamber, d, induction-valve chamber, b, induction valves, e, and ports, c and l, substantially as herein described, whereby provision is made for covering the said valves with water as the piston approaches or arrives at their respective end of the cylinder.

Second, The arrangement of the air-eduction chambers, r, passages, S, and openings, t and u, in relation to the eduction valves in the cylinder heads, substantially as and for the purpose herein specified.

Third, The water pipes, f, and check valves, h h, applied in combination with the eduction-valve chambers of a vacuum pump, to induct water from a suitable reservoir at each stroke of the pump piston, substantially as herein specified.

51,176.—Sky Rocket.—John W. Hadfield, Newtown, N. Y.:

First, I claim making the wings of a rocket reversible, substantially as and for the purposes described.

Second, The sleeve, C, in combination with the rocket, A, and reversible wings, B, constructed and operating substantially as and for the purpose set forth.

Third, The sleeve, C, in combination with the guide pin, d, constructed and operating substantially as and for the purpose described.

[This invention consists, first, in the application to a rocket of reversible wings, arranged so that the same can be turned in when the rocket is to be packed, and turned out when the rocket is to be fired; second, in the arrangement of a sleeve provided with notches and with a loop or eye, in combination with the reversible wings, in such a manner that, by the action of the notches in the sleeve, the wings, when turned out, are firmly held in position, and, at the same time, by the loop an opportunity is afforded to attach the rocket to the rod; third, in the use of a short piece of wire for the guide rod, in place of the ordinary stick, said piece of wire being fastened to a piece of wood, which, when the rocket is to be fired, is nailed fast to a fence or post, and which, together with the wire, does not exceed in length the rocket, and can be readily packed with the same in a box not larger than the rockets.]

51,177.—Steam Cock.—Albert Hallowell and H. R. Barker, Lowell, Mass.:

We claim the arrangement of the ground joint, e f, at the lower parts of the cap, F, and the key, E, applied to such cap, F, as described.

We also claim the arrangrment of the hand wheel, I, or the same and the tube, H, the screw, h, nut, i, the key shank, F, the ground joint, e f, and the cap screw, F, applied to the case, G, and shank, Z, of the valve, A, substantially as hereinbefore specified.

We also claim the arrangement of the annular groove, K, with the ground joint, e f, the key, E, and cap, F, connected with the valve and its case, substantially as explained.

51,178.—Seeding Machine.—W. H. Hartman, Fostoria, Ohio:

First, I claim the hinged valve, E, arranged and operated as and for the purpose described.

Second, I claim the valve, H, constructed, arranged, and operating as specified.

Third, I claim the combination of the valve, G, seed hopper, D, valves, E and H, arranged and operating as set forth.

Fourth, I claim the distributing apron, I, in combination with the valves, E and H, when arranged as specified.

51,179.—Machine for Threading Screws.—H. A. Harvey, New York City:

I claim the combination of a cam, a wedge, and a mold or former, constructed and operating to control a chaser or threading tool in its motions, perpendicular to the axis of the blank, or nearly so, substantially in the manner hereinbefore described.

51,180.—Burnishing Machine.—Charles H. Helmes, Poughkeepsie, N. Y.:

First, I claim combining two rotary burnishers, with a frame operating substantially in the manner and for the purposes hereinbefore set forth.

Second, I also claim, in combination with two rotating burnishers, an adjustable planisher, for the purpose hereinbefore set forth.

Third, I also claim, in combination with two rotating burnishers, jets of gas flame for heating the same, substantially as hereinbefore set forth.

51,181.—Manufacture of Albumen and Prussiate of Potash from Blood.—Adolf Henry Hirsh, Chicago, Ill.:

First, I claim the dilution of the blood with water, in the manner and for the purpose set forth.

Second, The use of the carbon, in the manner and for the purpose set forth.

Third, The use of the iron, in the manner and for the purpose set forth.

Fourth, The mode of drying the albumen, as set forth.

Fifth, The use of the different chemicals, in the manner set forth.

Sixth, The process of manufacturing albumen and prussiate of potash from blood, as developed and set forth in the different degrees of the process.

Seventh, The use of blood for the purposes mentioned, in the manner set forth.

51,182.—Clamp for Covering Rollers with Cloth or Canvas.—H. W. Holly, Norwich, Conn. Antedated Nov. 18, 1865:

I claim the covering of rollers with cloth, canvas, or other material, by doubling the latter over the former in a clamp, in the manner substantially as set forth.

51,183.—Pump.—J. G. Hovey, Waverley, Iowa:

First, I claim the central discharging penstock, A, furnished with a valve, a', and working in a chamber, B', which is adapted for receiving its water at the upper end when the penstock is elevated, substantially as described.

Second, The combination of the movable chambered portion, B, movable penstock, A, with the connecting rods, F G, lever, E, and vertical guide, D, substantially as described.

51,184.—Marine Clock.—Laporte Hubbell, Bristol, Conn.:

First, I claim constructing the upper part or bridge of the rear plate, B', independent of the lower part, B, substantially in the manner and for the purpose set forth.

Second, The lever, N, provided with the slot, a, and concave ends, d and f, when constructed and arranged to operate in the manner and for the purpose substantially as herein set forth.

51,185.—Washing Machine.—F. A. Hunt, New York City:

I claim the perforated trough, D D, in combination with the fluted rollers, C C, as and for the purpose specified.

51,186.—Latch for Blinds of Shutters.—B. S. Huntington, New York City:

First, I claim the lever, B, provided with catches, a a, and operating substantially as shown and described.

Second, In combination with the above, I further claim the dog, e, employed to lock the lever, B, as specified.

Third, I claim the hook, g, and eye, F, or equivalents thereof, in combination with the lever, B, substantially as and for the purpose herein specified.

51,187.—Horse Rake.—David G. Hussey, Nantucket, Mass.:

I claim the toothed segment, F, provided with the concentric flanges, d d, and having the treadles, H, attached by straps, G G, in connection with the rack bar, D, and toothed segment, C, on the rake head, A, all arranged substantially as and for the purpose herein set forth.

51,188.—Children's Sled.—David G. Hussey, Nantucket, Mass.:

First, I claim the combination of runners, H H, and pivoted frame, h, with the rods, i i, bell levers, j j, constructed and operating substantially as herein described.

Second, The jointed levers, i F, constructed and applied in combination with the sled and steering apparatus, and operating in the manner and for the purpose set forth.

Third, The combination of sliding foot-piece, L, lever, K^{xx}, shaft, K^{x}, levers, K K, spurs or pipes, J^{x} J^{x}, and spring, K^{x}, the whole constructed, arranged and operating as described and for the purposes set forth.

Fourth, The latch or lock, I^{a}, for holding the sled when extended to any desired length, operated by the wedge, n, applied and operating substantially as herein described.

51,189.—Drilling Machine.—A. P. Jackson and Leander Thompson, Memphis, Ind.:

We claim the cam, B, and lever, C, in combination with the windlass, D, all being arranged in connection with the ropes, I L, and drill, K, to operate in the manner substantially as and for the purpose set forth.

We also claim connecting and disconnecting the windlass with the shaft of the cam, by means of a clutch, so as to admit of the windlass being turned to raise the drill through the medium of the cam shaft.

[This invention relates to a new and improved drilling machine designed for general use, but more especially for boring deep wells. The invention consists in a new and improved means employed for operating the drill, and for raising the same out of the well when required.]

51,190.—Hay Elevator.—John H. Junkins, Upper Sandusky, Ohio:

First, I claim so constructing a machine adapted for elevating hay or other material that it will automatically convey its load to the point of delivery, at the pleasure of the attendant, substantially as described.

Second, A swinging crane or jib of an elevating machine, in combination with a sled tripod frame, tie rods, E E, and cap, D, all arranged substantially as described.

51,191.—Chronometer Escapement.—Jacob Karr, Washington, D. C.:

First, I claim providing the detent, b, in both its lever and cylinder form with the additional pallet, y, for the purposes substantially as above described.

Second, I claim in combination with the lever, with its lance, c, spring, e, and detent, b, the pallet, 3, and pallet, n, small of the balance, and the back spring, g, operating in the manner as above described.

51,192.—Railroad Turn-table.—J. I. Kinsey, South Easton, Pa.:

I claim, First, A turn-table for railroads, provided with a ball and socket pivot, substantially as set forth.

Second, The combination of the plate, D, standard, B, and cross-piece, d, with the ball, C, substantially as and for the purpose specified.

Third, The cap, E, when used in connection with and applied to the ball and socket pivot of a turn table, substantially as and for the purpose specified.

51,193.—Magnetic Telegraph.—Charles Kirchof, Newark, N. J.:

I claim, First, An independent mechanical operator having a to and fro motion, in contradistinction to a continuous motion in one direction, when said operator is so arranged as to close and break the circuit while passing in one direction only, and this I claim whether the design line be stationary, and the contact maker movable, or the reverse, or both are made movable, substantially as described.

Second, I claim so arranging the design line or a series of them, in combination with a contact maker, that by their combined action as herein described, additions, combinations or variations of the single signals may be produced at pleasure, by the use of a mechanical operator as set forth.

Third, I claim limiting the to and fro movement of the operating parts, by means of the slides, stops, and pointers, whereby I am enabled to regulate the number of signals sent as may be desired.

Fourth, In combination with the mechanical operator, I claim the use of the adjustable contact breaker, e^{2}, for the purpose of creating an interval or space between the various series of signals sent, whereby one series may be distinguished from another.

Fifth, I claim two or more independent mechanical operators, when arranged to operate successively, substantially as described.

Sixth, I claim so arranging two or more mechanical operators, that as one ceases to operate it shall release or set in operation another, whereby a compound telegram may be produced, substantially as described and illustrated in Fig. 6.

51,194.—Method of Applying Colors to Wood.—E. Knabeschuch, New York City:

I claim applying colors to wood, substantially in the manner described and for the purposes specified.

51,195.—Boot and Shoe.—Oliver Lafreniere, New York City:

First, I claim the combination of a wooden sole, a wooden heel and a shank, flexible from sole to heel, as an improvement in the manufacture of boots or shoes.

Second, In combination with the above, I further claim the metallic band, C, encircling and protecting the wooden sole, B, and securing the upper to the edge thereof, in the manner specified.

[This invention relates to the manner in which the sole is fastened to the upper. The sole consists of a piece of wood or other suitable material cut out to the proper shape and size, and the upper is drawn over its edges and held in place by a band of sheet metal, which is secured to the sole by nails driven in the edge of the same. No inner sole is used, and the sole itself is not perforated with holes, so that it is perfectly water tight. The instep is protected by a piece of leather or other flexible material, the rear end of which is secured under the heel, and its front end is held between the metal band and the edge of the sole in the same manner as the upper.]

51,196.—Carriage, Wagon, Etc.—Edward Lane, Philadelphia, Pa.:

I claim the body, A, its four springs, the levers, D^{2} D^{2}, connected directly to the cross piece, E, and levers, D^{2} D^{2}, connected to the rear axle through the medium of links, F F^{2}, when the whole is arranged and operated as set forth, and is applied to a carriage in which the said cross piece, E, is connected by a perch, G, to the rear axle, as specified.

51,197.—Washing Machine.—G. W. Large, Yellow Springs, Ohio:

I claim the combination of the swinging and removable open slotted segmental rack or rocker, D, with the open slotted roller, I, journaled in the hinged and gravitating open frame, H.

51,198.—Coffee Pot.—James H. Lee, Charlestown, Mass:

I claim the combination as well as the arrangement of the boiler, A, the plug, a, and its seat, b, the pipe, B, the coffee holder, F, and the pot, D.

I also claim the combination as well as the arrangement of the tube, H, with the pot, D, the tube, B, the vessel, F, the plug, a, the neck or seat, b, and the boiler, A.

I also claim the combination as well as the arrangement of the cap or cover, C, the coffee holder, F, the pot, D, the pipe, H, the tube, B, and the boiler, A.

I also claim the combination as well as the arrangement of the cap, E, the tube, H, the pot, D, the vessel, F, and the boiler, A.

51,199.—Washing Machine.—Dominicus R. and James T. Leighton, Cambridge, Mass.:

We claim a washing machine, the several parts of which are combined, arranged, and operated substantially in the manner and for the purpose above set forth.

51,200.—Stump Extractor.—Lorenzo D. Livermore, Beaver Dam, Wis.:

First, I claim the use of the sway line or chain, D, operating in the manner substantially as described to produce an increasing ratio of motion.

Second, The described combination of the wheel and axle, E B, sway line or chain, D, and draught chain, C, all arranged and operating in the manner and for the purpose set forth.

51,201.—Machine for Removing Seeds from Raisins.—Harvey Locke, South Boston, Mass.:

I claim the combination as well as the arrangement of the grate, C, the compressing jaw, E, and the said expeller, F, the same being provided with mechanism to operate them, substantially as specified.

I also claim the combination as well as the arrangement of the retainer or board G, and its operative mechanism with the grate, C, the compressing jaw, E, and the expeller, F.

I also claim the combination as well as the arrangement of each of the clearers, H I, with the grate, C, the compressing jaw, E, and the seed expeller, F, the whole being provided with mechanism to operate them, substantially as specified.

I also claim the combination of the spring blade, L, or its equivalent, with the seed clearer, H, the grate, C, the compressing jaw, E, and the seed expeller, F.

51,202.—Automatic Fan for Sewing Machines.—T. R. Lovett, Mount Airy, Pa.:

I claim the combination of the standard, C, fan, D, rock shaft, d, spring, b, hook, c, and cord or wire, h e, all arranged to operate in the manner and for the purpose set forth.

[This invention consists in the arrangement on the table of a sewing machine of a fan, in such relation to the treadle of the machine that the necessary motion will be imparted to it directly from the treadle, as the machine is operated for sewing purposes.]

51,203.—Harvester.—Abraham J. Manny, Freeport, Ill.:

I claim in folding, a hinged-cutting apparatus, so arranged as to have rotation on a longitudinal axis to vary the angle of presentation of the fingers to the ground, hanging the finger bar to the frame by a rod, which at one point forms the axis of rotation of the cutter bar, in a plane parallel to the line of motion of the knives, and at another point forms the pintle or axis of vibration for the vertical vibration of the outer end of the cutter bar.

In combination with the above, I claim making the said rod by an enlargement or hook, which it retains on the curved slot to form the traversing point of attachment and support for the pintle, by which the finger bar is hinged to the frame of the machine.

51,204.—Car Brake.—Samuel McCambridge, Philadelphia, Pa.:

I claim, First, The combination and arrangement of the counter shaft, E, and lever, J, with the shaft, C^{1}, by means of the belt, D^{10}, and pulleys, D, D^{1}, substantially in the manner described and for the purpose specified.

Second, The combination and arrangement of the lever, J, shaft, G, belt, D^{10}, shaft, C^{1}, and cams, F F, with the counter shaft, E, substantially as described, and for the purpose set forth.

51,205.—Fruit Ladder.—David McMaster, Bath, N. Y.:

I claim a ladder consisting of the shaft, A, the rungs, B, legs, C, and projecting spike, D, combined and constructed substantially as and for the purpose set forth.

51,206.—Evaporator.—Jacob E. Moeller, Terre Haute, Ind.:

I claim the hinged and perforated tray, so attached to the cool side of the pan and hinging within it, as to collect the feculent matters which by the rotation of the tray are drained and subsequently discharged, substantially as described and represented.

51,207.—Apparatus for Molding Rubber.—J. Moffitt, Chelsea, Mass.:

I claim in a molding press, the combination of a rotary series of molds, a rotary steam cylinder and a pressure mechanism, arranged and operating together for the purpose substantially as set forth.

I also claim the method of effecting the pressure in the molds by the rotary platens, operated upon by the friction rolls, substantially as set forth.

Also the method of adjusting the degree of pressure upon the platens, by hinging the two parts of the press together and regulating the distance between the same by the screw rods and nuts, substantially as described.

Also the mechanism for lifting the platens and plungers, operating substantially as set forth.

Also the eccentric construction of the surface of the press where the platens enter the same, by which each platen is gradually closed upon its molds substantially as described.

51,208.—Steam Cooking Apparatus.—A. F. W. Neynaber, Philadelphia, Pa.:

I claim the combination and arrangement in a steam cooking apparatus of the feeder, G D, and alarm device, a F, as and for the purposes set forth.

[The object of this invention is to produce a steam cooking apparatus of simple construction, but with great results in economy of time and labor and completeness of operation. It consists in general terms of an outer and inner boiler, the supply of water to the outer boiler being maintained automatically, and its exhaustion below a certain level being indicated by an alarm apparatus.]

51,209.—Car Coupling.—Albert G. Page, Augusta, Me.:

I claim the combination and arrangement of the spring, D, the carrier, C, the pins, g h i, cams, e e f f, abutment, m, and lever, E, and stop catch, d, as applied to the hooked jaw levers and the draw bar as and to operate as specified.

51,210.—Buckle.—Jefferson Peabody, Dixmont Center, Maine:

I claim the above specified buckle as made with one or more inclined planes, a, arranged in its frame and with a wedge, B, to rest and move on such plane or planes and with respect to the upper part of the buckle substantially as described, the said wedge being provided with one or more spurs or ridges to project from its upper surface as explained.

51,211.—Harvester.—Josiah W. Prentiss, Pulteney, N. Y.:

I claim the stationary cutters, E, when made and used as specified in connection with clasp bar, D, that holds them applied as set forth.

51,212.—Crushing and Baling Machine.—Jacob Price, Jr. Petaluma, Cal.:

I claim, First, Giving the baling chamber, a, reciprocating motion for the purpose of holding and pressing the sheets of material, it being crushed by the rollers as it comes from the same by means of the racks and pinions connected therewith and operated by the bevel wheels, V and V^{1}, lever, L, male and female clutches, d h and h^{1}, in combination with the catch, K, and rubber band, X, substantially as shown.

Second, I claim the loose rollers, B B, etc., working as described, for folding and compressing the material after it has passed into the baling chamber, together with grooves, s s, etc., in the peripheries of said rollers through which the strings, wires, bands or hoops may be placed in binding or confining the bale, substantially as described.

Third, I claim combining the crushing rollers and compressing rollers with a baling chamber having a reciprocating motion obtained as shown.

Fourth, I claim the means for discharging the bale by placing the braces against it and withdrawing the chamber in the manner specified.

51,213.—Breech-loading Fire-arm.—Franklin B. Prindle, New Haven, Conn.:

I claim the combination of the vibrating breech piece, D, with the jointed levers, F and G, when operated by the guard lever, H, or any other suitable lever acting on the knuckle joint, so as to communicate both a vibratory and a longitudinal motion to the breech piece, and the whole is constructed, arranged and fitted to produce the result, substantially as herein described.

51,214.—Hoop Lock for Baling Cotton.—Frank Quant, Painesville, Ohio:

I claim a hoop lock, constructed with a longitudinal narrow aperture, A, and an enlarged transverse aperture, B, substantially as herein shown, in combination with the pin or nail, D, operating as explained for the purpose set forth.

51,215.—Nursery Chair.—Samuel Rainey, New Orleans, La.:

I claim a folding nursery chair, made and operated substantially as above described.

[The object of this invention is to provide a nursery chair which shall be portable. It consists of a chair in whose seat is fixed a chamber of convenience, and whose back folds down upon the seat so as to cover it when not in use. The center, or panel of the back revolves within the frame of the back so as to be capable of presenting an upholstered side to the occupant of the chair when the back is raised.]

51,216.—Deodorizing Composition.—Andrew Rankin, New York City:

I claim the compound consisting of the ingredients herein specified, and either with or without the use of chloride of soda and mixed in about the proportions named, substantially as and for the purpose described.

[This invention relates to a new and useful compound or composition, to be used as a deodorizer to relieve the obnoxious and disagreeable effluvia and odors arising from urinals, water-closets and other places, the compound being of such nature that while no smell or odor of any consequence is emitted by it, and if any so slight as hardly to be perceptible, it will entirely neutralize all the obnoxious effluvia, and not as in all compounds, substances or materials heretofore used for such purpose, simply overcome one odor with another of a stronger but somewhat pleasanter nature' yet nevertheless not agreeable or desirable.]

51,217.—Drill Jar.—Charles A. Read, Lockport, N. Y.:

I claim a drill jar for artesian well boring, consisting of the full cylinder, E, including the slots, H, piston, G, including the guide pins, H', piston rod, G', screw plug and socket F, and screw head, f2, substantially as set forth.

51,218.—Securing Pulleys.—J. Wyatt Reid, New York City:

I claim the combination of a key with a set screw or screws, applied substantially as herein described, as a means for securing pulleys, gear wheels, arms and similar articles of shafts.

51,219.—Machine for Dressing Tiles.—John Reilly, Baltimore, Md.:

I claim, First, The holding swinging and adjustable clamp, A, constructed and operating substantially as described for the purpose set forth.

Second, The combination of arm, D, with the face plate of A.

Third, The combination of adjustable strip, e, with the face plate of A.

Fourth, The combination of removable angular strip, d, with the same plate.

51,220.—Bag Holder.—E. Reynolds, Corunna, Mich.:

I claim a bag holder constructed substantially as herein shown and described.

[An engraving and description of this invention appears in this number of the SCIENTIFIC AMERICAN.]

51,221.—Steam or Water Valve.—Charles E. Ricker, Lowell, Mass.:

I claim the combination and arrangement of the stand, B, with with the valve, E, spindle, D, packing nut, C, and wheel F, whereby the steam or water may be shut off from the spindle, and its packing renewed, without interrupting the passage of steam or water, through the pipe, substantially upon the principal and in the manner herein set forth.

51,222.—Sash Lock.—Archibald Ridell, Chicago, Ill.:

I claim the combination of the weighted lever with the sector, D, and wheel, F, constructed and arranged substantially as described.

51,223.—Railway Car Coupling.—Albert Roll, South Amboy, N. J.:

I claim First, Providing each one of the coupling boxes of a car coupling with a permanently attached coupling link in combination with the fixed self-acting catches, c c, substantially as described.

Second, Attaching the links, a a, to their coupling boxes by means of vertical rods, b b, in combination with the catches, c c, and fixed studs, e e, substantially as described.

Third, The stirrups, g g, in combination with the coupling links, a a, substantially as described.

Fourth, Loading the rear ends of the permanently attached coupling links, in such a manner that when these links are moved in a position to form a connection, they will remain in said position until the connection is made, substantially as described.

51,224.—Cook Stove.—J. J. Savage, Troy, N. Y.:

I claim a divided fire chamber for stoves and heaters, substantially the same as herein described, and for the purposes as set forth.

I also claim the partition plate, B, or its equivalent device, constructed and arranged, in the fire chamber, with its bottom side in proper position to the grate thereof, in the manner substantially as herein fully described and the purposes as set forth.

I also claim, in combination with the partition plate, B, the air-heating chamber, C, constructed and arranged substantially in the manner as herein shown and set forth, and for the purposes as specified.

I also claim arranging the air-heating chamber, D, the combustion chamber, Y, and air heating chamber, C, with reference to each other in such a manner that the products of combustion shall pass between said chambers in the manner substantially as herein shown, and for the purposes as set forth.

I also claim the method of constructing the under or fire side of stove center pieces or division plate and boiler hole covers, in the manner substantially as herein shown and described, and for the purposes as set forth.

51,225.—Breech-loading Fire-arm.—Francis Schopp, New York City:

I claim a pin, S, acted upon by a spring and operating the breech piece, G, in the manner and for the purpose substantially as set forth and specified.

51,226.—Balances.—Reuben Shaler, Madison, Conn.:

I claim the combination of the supports, E and F, the parallel bars, G G, and a spring, S, or its equivalent, arranged substantially in the manner and for the purpose specified.

51,227.—Grinding Mill.—Nicholas Shoemaker, Montrose, Pa.:

I claim the horizontal bar, A, applied to the spindle of millstones, in connection with the driver, B, provided with a recess to receive the bar, A, substantially in the manner as and for the purpose set forth.

51,228.—Fan.—Benjamin M. Smith, New York City:

I claim, as a new article of manufacture, a fan constructed of veneer, strengthened with a rim of metal or other suitable material, substantially as herein described.

51,229.—Steam Gun for Driving Stock from Railroad Tracks.—Franklin G. Smith, Columbia, Tenn.:

I claim the self-loading railroad steam gun, with its arrangements of stop cock for the explosive jet, spring catch for holding the ball in the chamber of the piece so that it cannot roll out, and tubes for containing the clay balls, substantially as shown and described.

51,230.—Rock Drill.—George W. Smith, Covington, Ky., and Charles F. Henis, Cincinnati, Ohio:

We claim the method herein described of freeing rock drills by a jet or jets of water under pressure which shall also remove by overflow the boring metal and debris produced by the drill and jet or jets of water, substantially as set forth in the foregoing specifications.

We also claim the combination and arrangement of the tube or hose, and the chambered drill, substantially as hereinbefore described.

51,231.—Treating Peat.—John H. Smith, New York City:

I claim, First, Treating peat with wet steam, substantially as and for the purpose described.

Second, The application to peat of wet and superheated steam combined, substantially as and for the purpose set forth.

51,232.—Self-acting Brake.—C. A. Smyth, Charleston, Ill.:

I claim the shaft, K, provided with the cranks, e f f, and shoes, L L, placed on the bar, J, in relation with the wheels, C, as shown in connection with the slotted reach, D, and the front bolster, H, connected by a pivot bolt, a², to the wagon bed or body near one end, fitted on the king bolt, G, as a fulcrum, and connected to the shaft, K, by the rod, g, all arranged to operate in the manner substantially as and for the purpose set forth.

I further claim the slotted shoes, L L, placed on the cranks, f f, of the shaft, K, for the purpose of admitting the shoes to rise under the reverse motion of the wheels, C, in backing, substantially as set forth.

51,233.—Paper Collar Machine.—George K. Snow, Watertown, Mass.:

I claim the above described arrangement and combination of end and button-hole dies irrespective of the middle button-hole dies.

And I also claim the above described arrangement and combination of end and button-hole dies, inclusive of the middle button-hole dies.

And, in combination with the end dies, and the middle button-hole dies arranged as specified, I claim a mechanism for adjusting the distance of the said middle button-hole dies from the end-forming dies.

And, in combination with the end-cutting dies and the middle button-hole dies arranged as described, I claim the gages, Z Z, whether stationary on the carriage, B, or adjustable thereon as specified.

Ialso claim the end-forming dies, substantially as described, for shaping the contiguous ends of two collars at one operation.

I also claim the formation of collars from a continuous strip in the manner, or with their ends to envelop one another, as hereinbefore described, and as represented in Fig. 9.

I also claim the formation of collars in a continuous strip of paper, as described, by means of end-forming dies arranged as specified, and by alternately changing the strip from one side to the other of the middle line of the dies, as specified.

51,234.—Paper Collar Machine.—George K. Snow, Watertown, Mass.:

I claim an automatic combination consisting not only of mechanism for feeding a shirt along with an intermittent motion, and of machinery for stamping shirt collars or articles from such sheet, but of machinery for embossing such collars or articles on both of the opposite sides thereof.

And I also claim a combination consisting not only of such mechanical elements, but a mechanism for folding each collar.

And I also claim a combination consisting not only of mechanism for manufacturing such collars from a sheet, and embossing them on two opposite sides and folding them in manner as described, but mechanism for discharging each collar from the folding element or machinery, after the folding of such collar thereby.

I also claim a combination consisting not only of mechanism for manufacturing or stamping shirt collars from a sheet, and feeding them as described, but mechanism for curving or bending each of such collars, in manner and for the purpose specified.

I also claim a combination consisting not only of mechanism for manufacturing or stamping shirt collars from a sheet, and mechanism for embossing them as described, but mechanism for folding them, and mechanism for curving them in the manner and for the purpose as specified.

I also claim the arrangement of the folding tablet inclined relatively to the stamping mechanism, in order that each collar, on being discharged from the latter, may be caused by the action of gravity to slide down the tablet and against its guides, and abut against its stop or stops, and be carried underneath the folding blade, substantially as specified.

I also claim the combination of the edge guides d' d', or the same and the top surface guides, e' e', and stop, b', or such stop, b', and the end stops, c' c', with the inclined slotted tablet and its folding blade, and

I also claim the combination of the same, and mechanism substantially as described, for making collars from a sheet, or making and embossing collars.

I also claim the combination and arrangement of the stops, f' f', with the mechanism for stamping the collars from a sheet of paper or other material.

I also claim the improved collar discharging and curving mechanism, consisting of the driving roller, c4, and the endless belt, K, and supporting rollers, or their equivalents, arranged together in manner, and so as to operate substantially as described.

I also claim the combination of the adjustable male and female dies for forming the ends of the collar.

I also claim the arrangement of the severing dies with the male and female dies for cutting the ends of the collar.

I also claim the arrangement of the embossing dies, with the end cutting and severing dies as specified.

I also claim the above-described combination of separate adjustable male and female dies for forming the ends with the separate adjustable dies for forming the sides of the collar as herein described, the said adjustable male and female dies enabling collars of different sizes to be made as herein described.

I also claim the dies or cutters as herein described for forming the lower edge of one and the upper edge of another collar at the same time.

I also claim a combination consisting of the mechanism as described for forming collars, and the mechanism as described for folding them.

I also claim the combination of the end guides, d' d', with the top guides, e' e', for guiding the collar to the proper position to be folded.

I also claim the combination of dies for embossing both sides of the collar with dies for forming the collar substantially as described

I also claim the adjustable male and female dies for forming the ends of the collar and the end button-holes at the same time as herein described.

51,235.—Die for Cutting Paper Collars.—Geo. K. Snow, Watertown, Mass. Antedated Nov. 15, 1865:

I claim the combination of the adjustable end cutters, C C, with either one or two side cutters, as described.

Also, the combination of adjustable button-hole cutters and end cutters with either one or two side cutters.

Also, the combination of the adjustable end and button-hole cutter and one or two side cutters, and a middle button-hole cutter stationary relatively to the side cutter to which it may be connected, the whole being substantially as and for the purpose hereinbefore specified.

51,236.—Apparatus for Heating, Cooling, and Ventilating.—D. E. Somes, Washington, D. C.:

I claim, First, The construction and arrangement of a system of tubes or pipes in a cooling tank or cistern so as to obtain a large cooling surface, substantially as set forth and described.

Second, The combination of a system of warming and cooling apparatus with devices for receiving, cooling, or warming, and distributing air in buildings or apartments as described.

Third, The combination of the flues or channels for introducing air into and expelling air from buildings, so as to economize in heating or cooling, as herein described.

Fourth. The combination of an air-forcing apparatus with a system of flues or channels for cooling air as described.

Fifth, The arrangement of devices whereby the foul air is driven off through or near the floor, and fresh air is thrown into the upper part of the building.

51,237.—Mode of Cooling Air.—D. E. Somes, Washington, D. C.:

I claim, First, The combination of the vane with an air-cooling apparatus, as described.

Second, The valves to conduct air and prevent the back thereof, in combination with the air-cooling apparatus, as described.

Third, The liquid cooler or coolers in combination with the air-cooling apparatus, substantially as described.

Four h, The combination of the refrigerating chambers with an air-cooling apparatus, substantially as described.

Fifth, The devices for admitting and regulating the air, as described.

Sixth, The refrigerating chambers, D, constructed and cooled substantially as described.

Seventh, The air cooler, in combination with tubes or channels for conducting air to different apartments, as described.

Eighth, The combination of devices so as to form apparatus to be used for either heating or cooling air or water, or air and water, substantially as described.

Ninth, The combination of the propeller wheels with air flues, or ducts, so as to operate substantially as described.

51,238.—Artificial Arm.—Edward Spellerberg, Philadelphia, Pa.:

I claim making the hand adjustable in the wrist socket in any manner equivalent to that herein described, when the parts transmitting motion to the finger mechanism are constructed relative to the hand adjustment, substantially as and for the purpose specified.

I also claim, so actuating the finger mechanism of a detachable hand by the described devices or their equivalents, that the hand can be removed from the wrist socket without separately disconnecting its mechanism from that of the arm.

I also claim, Third, providing the described grasping instrument or its equivalent, with a swiveling socket, as and for the purpose set forth.

51,239.—Embroidering Attachment for Sewing Machines.—Martin W. Stevens, Stoughton, Mass.:

I claim the combination or mechanism for operating the embroidering yarn-carriers or arms, E E, the same consisting of the studs, f f, the actuator, F, and the vibrator, G, with its arms, p g, and spring, r, and stop pins, S S, the whole being substantially as specified.

I also claim the combination of the screw, t, and spring, m, and the holding plates, i k, and the actuator, F, applied to the presser, and the arms, E E, substantially as specified.

I also claim the combination of the socket piece, d, or its equivalent with the presser foot and the arms, E E, applied thereto as described.

51,240.—Stove-pipe Elbow.—O. W. Stow, Plantsville, Conn.:

I claim making the two parts of the elbow to turn or swivel on points or pivot, D E, in combination with the bolt, C, as and for the purposes set forth.

51,241.—Heel Calk.—Thomas Symonds, Portland, Me.:

I claim the combination of the plate, A, having the slot, c, the prongs, b b, and turned-up points, d d, with the button, f, as and for the purpose described.

51,242.—Toe Calk.—Thomas Symonds, Portland, Me.:

I claim the combination of the plate, A, the band, B, the rings, C, the barbs, e, the points, d, and the shoulders, f, as and for the purpose described.

51,243.—Breech-loading Fire-arm.—Wm. Tibbals, South Coventry, Conn.:

I claim securing a loose anvil in the cartridge shell, when placed in the gun barrel, by means of pressure applied thereto, substantially as described.

51,244.—Saw-mill.—James Tracy, Brewer, Me.:

I claim the improved gage, as not only having its movable gages, D, made with gains, as represented, for receiving and holding the saws, but as furnished with the stationary collar, E, and the nuts, C B B B, and their separate screws, arranged as specified.

51,245.—Plow.—James Wallace, Berks County, Pa. Antedated May 28, 1865:

I claim the land side, C, and share, L, when constructed as described, in combination with the cutter, F, as herein specified.

51,246.—Churn.—D. T. Ward, Cardington, Ohio:

I claim the arrangement of the dasher shaft with the wing, d, the rods, b b, and the dashers, a a, as and for the purpose specified.

51,247.—Guide for Sewing Machine—Albin Warth, Stapleton, N. Y.:

I claim, First, A cloth guide for a sewing machine, composed of a fork with three or more prongs disconnected at their outer ends, substantially as and for the purposes set forth.

Second, Giving to the prongs of the forked guide an oblique position, substantially as and for the purposes described.

Third, The adjustable gage, C, applied to the forked guide, A', substantially as and for the purposes set forth.

Fourth, The angular guide bar, D, in combination with the forked guide or guides, and with the main gage, B, constructed and operating substantially as and for the purposes described.

51,248.—Drill Gage.—Wm. C. Wells, Newark, N. J.:

First, I claim the construction of an adjustable gage in such a manner as to bear on the sides, point, and both the cutting lips of a drill simultaneously.

Second, I claim the manner of placing a stationary blade, B, above a V-shaped guide, A, so that said blade shall stand vertically and obliquely, and shall describe two given angles, for the purpose as herein specified.

Third, I claim the transverse bladé, C, which is provided with a tongue, I, and which is attached to the stationary blade in such manner and for such purpose as is herein set forth.

Fourth, I claim providing the traverse, C, with a shoulder, S, so as to underlap the lower edge of the stationary blade, B, for the purpose as herein specified.

51,249.—Flue Cleaner.—Norman W. Wheeler, Brooklyn, N. Y.:

I claim the combination of the pipe, a, nozzle, B, handle, f, and flexible or jointed pipe, E, constructed substantially as described and for the purposes set forth.

51,250.—Piston Packing.—Jerome Wheelock, Worcester, Mass.:

I claim, First, Arranging the T-shaped or grooved ring, D, in two or more sections, as and for the purpose described.

Second, The curved recesses, c, and the tongues, d, at the ends of the sections of the packing rings, as and for the purpose shown and described.

Third, The mortices or recesses, f, in combination with the sectional packing rings, constructed and operating substantially as and for the purpose set forth.

[This invention relates to certain improvements in that class of pistons in which sectional rings are used, in combination with a T-shaped or grooved ring placed between the piston head and the follower.]

51,251.—Carriage Wheel.—Edward S. Winchester, Boston, Mass.:

I claim providing wheels with projections, arranged to operate substantially as set forth.

51,252.—Machine for Boring Tubes.—Arealous Wyckoff, Elmira, N. Y.:

I claim, First, The combination of two or more concentric annular cutters, the stocks supporting which have a common axis of rotation.

Second, The combination of the head, A, with two or more spiral stocks, having a common axis-supporting concentric fannular cutters when constructed substantially as and for the purpose set forth.

Third, Constructing the cylindrical frames exterior to the central one, in a gang of annular cutters, having spiral flanges, with the open spaces between them for the free discharge of the cuttings substantially as set forth.

Fourth, The arrangement of the supports for the open spiral stock, substantially as and for the purpose set forth.

51,253.—Broom.—Daniel Young, Burlington, Ill.:

I claim the combination of ferrule, A, fork, F, cass, P, bolt, O O", and clasps, 1 2 3 4, the whole constructed, arranged and operated substantially in the manner and for the purpose set forth.

51,254.—Machine for Shaping Heels of Boots and Shoes.—James H. Belser (assignor to himself and Sidney G. Fay), Marlboro', Mass.:

I claim the combination of the toe clamp, g, and its latch, b, with the standard, c, provided with an adjustable screw, and applied to the base or the holder, as described.

I also claim the combination and arrangement of the carriage, h and its adjustments with the knife, C, the same being affixed to such carriage in manner and for the purpose substantially as described.

I also claim the combination and arrangement of the rocker tube, E, with the slider, D, its supporting standard, b, the knife, C, and the shoe holder, as described.

51,255.—Tobacco Cartridge.—A. C. Breckenridge, Meriden, Conn., assignor to H. J. Hale, New York City:

I claim a tobacco cartridge, constructed substantially as above described.

51,256.—Harness Hames.—John E. Brown (assignor to himself, Charles A. Mott, and A. A. Peebles), Lansingburgh, N. Y.:

I claim adjustable harness hames, formed by combining the movable part, C D G, and spring, H J, with the hames, substantially as described and for the purpose set forth.

51,257.—Screw-cutting Machine.—Joseph K. Brown, Providence, R. I., assignor to Joseph K. Brown and Sharpe:

I claim, First, The combination of a set of griping jaws, l, and a set of wedges on a sliding rod or tube, m, or its equivalent, with a hollow screw, F, the same being constructed and arranged to operate within a revolving spindle, substantially as described, for the purpose specified.

Second, I claim the combination of the threading tool holder and the reversible clutch, constructed and arranged to operate with a revolving spindle, substantially as described, for the purpose specified.

51,258.—Breech-loading Fire-arm.—Jarvis Davis (assignor to Patrick Smith), Buffalo, N. Y.:

I claim, First, The spirally grooved sleeve, E, provided with a thumb-piece, H, arranged and used for the purpose of imparting the requisite movements to the cartridge holder, substantially as set forth.

Second, The combination of the sleeve, E, spring bar, F, and sliding abutment, D, when arranged and operating in the manner and for the purposes set forth.

51,259.—Meat Compound.—B. M. Fowler, Hackensack, N. J., assignor to himself and Wm. Hanigan, Brooklyn, N. Y.:

I claim a meat compound, prepared as above specified.

[The object of this invention is to prepare a compound of meat with the requisite quantity of salt and other spices, in such a manner that the same can be kept for any length of time during all seasons of the year, and that it will form an exquisite relish for family consumption or for travelers. For these reasons the compound may be properly termed "People's Excelsior Relish."]

51,260.—Barrel Head.—George W. Gilbert, Radnor, Pa., assignor to himself, G. Righter, Jr., and J. B. Maxwell, Spread Eagle, Pa.:

I claim the within-described barrel head, consisting of the pieces, B B' and D, and the set screw, E, the whole being constructed and adapted to a barrel, substantially as and for the purpose herein set forth.

51,261.—Magnetic Telegraph.—Chas. Kirchhof, New ark, N. J., assignor to himself and Leonard J. Stiastry:

I claim, First, The indicating and recording instrument, actuated by electricity, arranged to automatically shift the actuating mechanism, and thereby move the dial or index in one or the other direction, in accordance with the transmitter, or as may be desired by the attendant, substantially as described.

Second, Securing a harmonious action between the transmitter and a series of receiving instruments, by so arranging or constructing the latter that their dials or indices shall all cease to move or operate at certain fixed place or character common to them all.

Third, Transferring the motion of the receiving instrument at pleasure, to an instrument to be operated independent of the indicator, by the same helix or helices.

Fourth, The combination of the recording cylinder, or its equivalent, with the indicating instrument, arranged and operating substantially as set forth.

Fifth, Transmitting the communications, automa ically, by a mechanism defining the number of electric impulses, their direction and intervals, by a simple manipulation of the attendant, substantially as described.

Sixth, The reversing gear, when arranged to be operated by electricity, for the purpose of automatically changing the motion of telegraphic mechanism.

51,262.—Pegging Jack.—William R. Landfear, Hartford, Conn., assignor to David Whittemore, North Bridgewater, Mass.:

I claim the application of the last holder, supporting plate, B, to the standard, C, by means of three sustaining pins or screws, d e f, and their slots, g h i, arranged substantially as described, the slot, i, of the lower screw, f, being formed with curves whose radii proceed from the axes of the screws, d e, as explained.

51,263.—Preserving Eggs.—Charles A. La Mont, New York City, assignor to C. A. La Mont and David A. Burr, Washington, D. C.:

I claim as a new article of manufacture eggs dessicated and hardened into small, bright, thin flakes or particles, readily soluble in cold water, and retaining their qualities and flavor, all substantially as hereinbefore set forth.

51,264.—Preserve Can.—Peter H. Niles, Boston, Mass., assignor to himself and Augustus Russ, Cambridge, Mass.:

I claim as an improvement in preserve cans, the elastic packing ring, b, in combination with the cover, B, provided with wedges or inclines, d, and the hooks, e, or their equivalents, operating substantially as and for the purpose set forth.

51,165.—Spike.—Daniel R. Pratt (assignor to J. Marcus Rice), Worcester, Mass.:

I claim the above-described corrugated spike, as an article of manufacture.

51,266.—Melting and Smelting Furnace.—Wm. Quann and Wm. T. Smith, Philadelphia, Pa., assignors to themselves, A. R. Wetmore, New York, and Chas. C. Lathrop, Delanco, N. J.:

We claim, First, The basin, H, of the furnace, made of the concave form represented, for the purpose specified.

Second, The combination and arrangement of the said concave basin with the slag hole, I, and tapering hole, H.

Third, The arrangement of the inclined bed of the furnace and the blast openings and pipes, n n.

Fourth, The chimney, E, with its cover, d, and two compartments, F and G.

Fifth, The combination of the said chimney and its compartments with the pipe, L, and vessel, K, or their equivalent.

Sixth, The combination and arrangement, substantially as described, of the basin and bed of the furnace, the chimney, and the opening, f.

51,267.—Forging Apparatus.—Edward A. Raymond, Brooklyn, N. Y., assignor to himself and Charles Merrill & Sons, New York City:

I claim, First, A cup leather packing for the piston rod of atmospheric hammers, applied as and for the purposes specified.

Second, I claim securing the cup leather within the basin in the cylinder head by the movable ring, as and for the purposes specified.

Third, I claim the annular packing expanders applied at one or both ends of the cylinder, for pressing the cup leathers of the piston to shape, as set forth.

51,268.—Window Blind.—John C. Reed (assignor to himself and Joshua Y. Billard), Stamford, Conn.:

I claim, First, The combination of the crank, L, and bar or rod, K, with the bevel gear, N R, and the slats of the window blind, substantially as and for the purpose set forth.

Second, The combination of the self-adjusting clutch, T, with the bevel gears, R N, and the casing or frame of the window, substantially as described and for the purpose set forth.

Third, The combination of the coiled spring, W, with the clutch, T, and window casing or frame, substantially as described and for the purpose set forth.

[This invention consists in connecting a self-adjusting clutch with the slats of a window blind, by means of a crank and a pair of gear wheels, in such a way that the slats may be opened or closed or set at any desired angle, without opening the window—the improvement in no way interfering with opening and closing the blinds.]

51,269.—Revolving Fire-arm.—Joseph Rider, Newark, Ohio, assignor to himself and E. Remington & Sons, Ilion, N. Y.:

I claim, First, The groove and flange at the rear of the revolving cylinder, with the openings, 1 2 3, etc., cut through said flange, for the jaw of the extractor to work through, substantially as and for the purpose described.

I also claim, in combination with a pawl for turning a cylinder, a pawl guide, constructed and operating substantially in the manner and for the purpose described.

51,270.—Children's Bed-clothes Retainer.—M.L. Thompson (assignor to himself and E. L. Childs), Brooklyn, N. Y.:

I claim a ring or collar, adapted to be placed around the neck of the child, and to retain the bed clothes in place, substantially as described.

[Much annoyance and trouble is given to mothers and nurses by children constantly getting uncovered at night, owing to their restlessness. The feet or hands of the children are almost constantly in motion, and it is impossible to keep them covered unless they are continually watched, and if they be neglected and become uncovered serious colds are often the result, which, many times, especially in the spring and winter seasons, develop into some ailment fatal to the child. The object of this invention is to produce a simple means for retaining the bed clothes in place over the child, no matter what position it may assume, and for this purpose a ring or collar of suitable construction is employed, which is to be placed around the child's neck, and to which the bed clothes are attached.]

51,271.—Stone-cutting Machinery.—George J. Wardwell, Rutland, Vt., assignor to the Steam Stone-cutter Company, New York City:

I claim, First, So constructing the yoke, F2, and applying it to the standard, F, that it will admit of the cutters being removed from the machine, or again replaced at pleasure, substantially as described.

Second, The combination of an open yoke, F2, with a hinged standard guide, F3, substantially in the manner and for the purpose described.

Third, Providing for adjusting the cutters together with their guides, and setting them at any desired angle, for the purpose and in the manner substantially as described.

Fourth, The pivoted standard boxes, G G, arranged on the sides of the frame, A, and adapted for receiving the standards, F F', and operating substantially as described.

Fifth, Arranging two gangs of reciprocating cutters upon a frame, A, and to work outside of the track upon which the machine is moved, substantially as described.

Sixth, The application of the windlass, J, to a stove-cutting machine, for the purpose of lifting and supporting the cutters, substantially in the manner described.

Seventh, The combination of the feed wheels, C' D, shifting pinion, B3, and movable arm or lever, B2, with the vibrating beams, E E, substantially as described.

51,272.—Machinery for Cutting Stone.—George J. Wardwell, Rutland, Vt., assignor to the Steam Stone-cutter Company, New York:

I claim the combination of a feed mechanism, a stone cutting machine and a steam engine, substantially as and for the purpose described.

51,273.—Cutter for Stone-Channeling Machinery.—George J. Wardwell, Rutland, Vt., assignor to the Steam Stone-cutter Company, New York:

I claim, First, The combination of one or more diagonal cutting edges, with transverse cutting edges, formed on the ends of bars which are secured together edgewise, so as to form a gang, substantially as described.

Second, The stepped arrangement of the cutters on both sides of a central cutter, substantially as and for the purposes described.

Third, The combination of a pyramidal cutter with transverse and diagonal chisels, substantially as described.

51,274.—Gage Cock.—Charles T. Woodman (assignor to himself and Chas. E. Woodman), Boston, Mass.:

I claim the improved cock or faucet, constructed substantially as described viz: with a roller valve made and applied to a shaft, as explained, and arranged so as to operate with the curved inner surface of the case, and with inlet and outlet passages leading therefrom, in the manner substantially as hereinbefore set forth.

51,275.—Liquid Cooler.—Charles P. Zimmerman, Newark, N. J., assignor to himself and Isaac P. Brown, Plainfield, N. J.:

I claim the arrangement of a series of chutes, A A, and aprons, B, in combination with the cooling chambers, C, connected with each other by pipes, D, and arranged in relation to each other and the chutes, A A, substantially in the manner and for the purpose described.

51,276.—Lubricating Apparatus.—Jean Francois Auguste Aerts, Antwerp, Belgium. Patented in Belgium, Sept. 5, 1864:

I claim, First, A reversed gutter applied and constructed substantially as described and operating to prevent water from being projected violently against the upper part of the box, substantially as set forth.

Second, A horseshoe shaped piece or half dome of metal, in combination with a groove on the axle, the two being located with reference to the upper brass and to each other and acting in combination, substantially as hereinbefore specified.

And last, in combination with a rotating disk elevating fluid above an axle, a packing applied beneath the axle, constructed and operating substantially as described.

51,277.—Mode of Attaching Stakes to Railroad Cars.—Joaquin Fortun, Cienfuegos, Cuba:

I claim the application to railroad platform cars of side stakes, so constructed as to turn along side of the car in one operation, as herein described, thus saving much time.

51,278.—Filtering Press.—L. P. R. De Massy, Paris, France:

I claim, First, The combination of the inner and outer conical perforated casings, F and G, constructed and operating substantially as described, for the purpose specified.

Second, The combination of the said inner and outer perforated casings, with lining or covering of wire, cloth, or textile fabric.

Third, The combination of the said inner and outer perforated casings, with the hydraulic press and rails, D D, the whole being arranged and operating substantially as and for the purpose herein set forth.

51,279.—Apparatus for Taking Photographic Panoramic Views.—John Robert Johnson and John Ashworth Harrison, London, England. Patented in England, Sept. 5, 1862:

We claim, First, The improved construction and arrangement of the parts of the flat plate camera, so that their motions are smooth and equable, and free from vibration, and so that the whole apparatus is rendered more compact and portable than those previously suggested.

Second, The new mode or modes of obtaining the relative motions of the lens and sensitive plate, such motion being obtained directly by mechanical means, or by appliances constructed mechanically, instead of by guide curves or grooves formed by trial, as has heretofore been proposed to be done.

Third, The improvement in the gearing when working both forms of camera.

Fourth, The application of a spring or weight to give motion to such cameras, and of means for regulating such motion to such cameras, and of means for regulating such motion, both at variable and invariable rates.

Fifth, The application of an expanding diaphragm to regulate the exposure in cameras moving at an invariable rate.

Sixth, The expanding diaphragm placed between the lens and the sensitive plate by means of which the sky and cloud effects may be obtained, and by which the amount of exposure may be regulated.

Seventh, The general mechanical arrangements by which these improvements are carried into effect in the different forms of cameras described.

51,280.—Method of Preserving Animal and Vegetable Subtances.—Richard Jones, London, England:

I claim the herein-described apparatus and method of preserving animal substances, by displacing air from the vessel containing the substance to be preserved, by the introduction therein of an inert fluid such as water or oil, and then the displacement of such fluid by the introduction of nitrogen gas or gases, having an affinity for oxygen, substantially as explained.

51,281.—Process of Making Gun Barrels, Etc., from Bessemer Steel.—James Thompson, Bilston, England:

I claim the making of seamless gun barrels, ordnance, or other like tubular bodies, of Bessemer's homogenous metal or steel, in the manner herein described.

REISSUES.

2,113.—Mouth-piece for Cigars.—Jonathan Ball, Elmira, N. Y. Patented March 28, 1865:

I claim the mouth-piece for a cigar composed of a wooden tube and paper socket, substantially as herein described.

2,114.—Method of Treating Offal.—John P. Baugh, Edwin P. Baugh, and Daniel Baugh, Philadelphia, Pa., assignees of William Adamson. Patented Feb. 14, 1865:

We claim, First, Utilizing offal by draining from it the greater portion of its fluid matter preparatory to the drying of the mass, for the purpose described.

Second, Simultaneously drying and disinfecting offal, by subjecting it to the direct action of the products of combustion, substantially in the manner set forth.

2,115.—Method of Making Shoes and Dies for Quartz Stampers.—P. W. Gates, Chicago, Ill. Patented July 31, 1860:

I claim, First, Producing shoes and dies for quarts crushing machinery by casting in a metal mold an outer case or shell of metal, about a central chilled metal core, substantially as described.

Second, In the operation of casting shoes and dies for crushing machinery, I claim using a central core of metal and an external flask or mold, for the purpose of producing a shoe, or a die, which is composed of more than one piece of metal and which has its outer shell chilled in a direction from its center toward its circumference, as well as from its circumference toward its center, substantially as described.

Third, A chilled cast metal shoe, constructed with a soft unchilled attaching stem, upon the lower chilled portion of which the shoe is cast, substantially in the manner and for the purpose described.

Fourth, Making the projecting portion of the stem of a stamp head-shoe of taper form and of unchilled metal, while the body of the shoe is chilled, the shoe being cast upon the lower chilled portion of the stem, substantially as and for the purpose described.

Fifth, In the operation of casting a chilled shoe for stamping machinery, I claim producing a chill upon the body of a shoe and inclosed portion of the stem, and leaving unchilled the projecting portion of the stem thereof, substantially as described and for the purposes set forth.

Sixth, A stamp head-shoe or die, which is chilled, substantially in the manner described, from center toward the circumference and vice versa, and formed of more than one piece of metal, or of two pieces of metal cast one upon the other, and which are united or held together by means of the varying diameter of the central piece, substantially as set forth.

2,116.—Machine for Cleaning Sheet Metal.—Edmund A. Harvey, Wilmington, Del. Patented April 4, 1865:

I claim, First, Cleaning sheets of metal, by scrubbing and washing them, and preventing their being oxidized in consequence of moisture by afterwards subjecting such sheets to heat, and thus causing the moisture to be evaporated [from] their surfaces, substantially as described.

Second, The combination of the squeezing rollers, E E, and a heater for quickly drying the sheets, substantially as described.

Third, The rotary brushers, C C, in combination with the guides, G G, and feed rollers, B B, when arranged as to clamp the sheets between them for the purpose described.

Fourth, The reciprocating brushers, D D, in combination with the feed rollers, B B, when so arranged as to clamp the sheets between them for the purpose described.

Fifth, In machines for cleaning sheet iron as described, I claim, in combination with the rotary or reciprocating brushes, the guides, G G, which form a throat for directing the sheet metal to the brushes.

2,117.—Sawing Machine.—F. W. Robinson, Richmond, Ind. Patented Sept. 5, 1865:

I claim a drag saw in which the saw is rigidly attached to the saw bar, when said saw bar is provided with a slot at its rear (and working upon or in guides situated at or near the driving shaft.

2,118.—Refining Iron.—Christian Shunk, Youngstown, Ohio. Patented Feb. 12, 1856. Reissued May 31, 1864:

I claim the refining of molten crude iron from the ore or the remelted pig metal, by the employment and the application of compressed air forced in combining with the carbon of the crude metal, and thereby decarbonizing or partially decarbonizing the same and rendering it fit to mold into ingots, or into a mass of malleable refined iron to make blooms for forging or rolling purposes and the use of common salt as a flux.

These claims I make jointly and separately.

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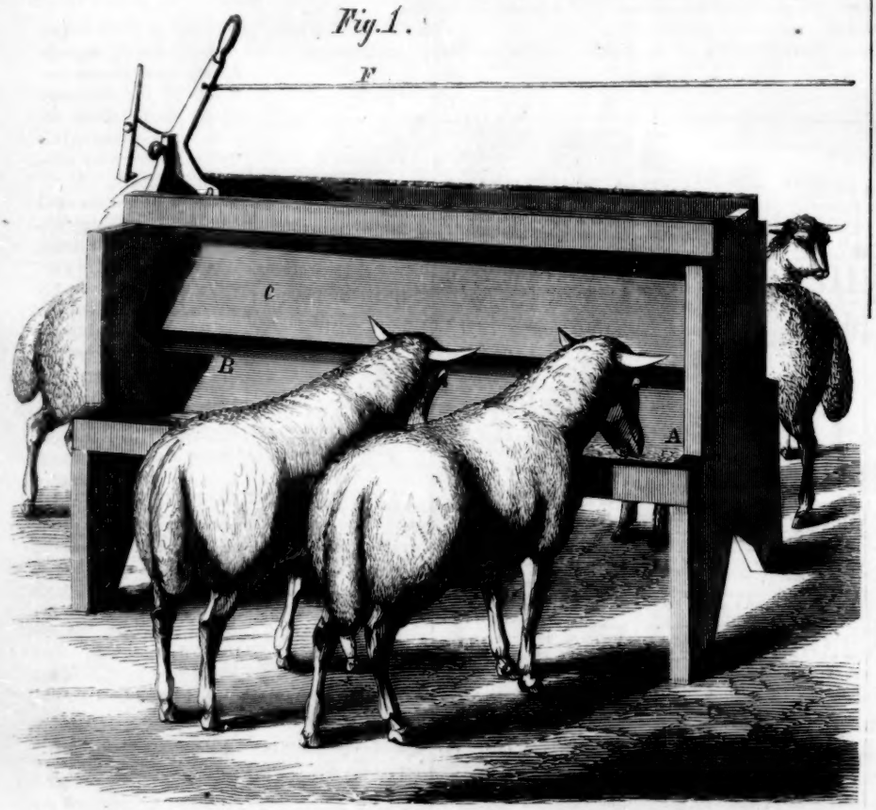
Improved Sheep-feeding Rack.

The object of this invention is to obtain a trough by which a number of sheep may be fed equally, so that each will have its proper share. Sheep eat very rapidly, and unless some plan is adopted to regulate the supply the strongest and foremost sheep will get more than their share. The trough here shown is believed to remedy this difficulty. It consists in having a hopper placed over and above troughs—one or two of the latter being used; also, in having the hopper constructed in such a manner that the grain or feed may be discharged therefrom, more or less rapidly, into the feeding trough or troughs, and equally distributed in them throughout their entire length. The details are as follows:—A represents a feeding trough, one on each side, supported at a suitable hight by end pieces or any proper framing. These

Fig. 1.



BARNARD'S SHEEP-FEEDING RACK.

feeding troughs are divided by a partition, B, formed by two boards or planks, which are inclined and meet at their upper edges, as shown in Fig. 2. This partition extends a considerable distance above the troughs, A, and projects within the hopper, C, which is composed of two pivoted boards—one at each end of partition, B. The pivots of the sides, *b b*, are fitted in the pieces, which extend up above the troughs, and form the ends of the hopper as well as the ends of the trough. The sides, in consequence of being hung, or suspended on the pivots, may be adjusted so that their lower ends will be in contact with the partition, B, as shown in Fig. 2; or said ends moved out from B, as shown in dotted line in the same figure. In the former adjustment of the sides, *b b*, the hopper, C, is closed; in the latter adjustment it is open. The sides of the hopper are set by means of two arms, D, the outer ends of which are pivoted in the sides, the inner ends of the arms lapping over each other, each being slotted longitudinally, having a pin passing through the slots and through the lower end of an upright arm, D, which is fitted to a bent lever, E. It will be seen that by moving this lever, E, the sides, *b*, may be adjusted so as to open and close the hopper and let down the grain or feed into the trough in greater or less quantities, as may be desired, the same falling down the inclined sides of the partition, B, into the troughs. In case several of these devices are used, their levers, E, may be connected to a rod, F, so that the sides of all the hoppers may be adjusted simultaneously, and the levers, E, may be retained at any desired point within the scope of their movement by means of a pawl connected to them by a pivot, and having their lower ends engaging with a segment rack, as shown in Fig. 1. The device may be constructed with only one trough, A, and hopper, C, constructed with only one side, *b*, but the double form would be preferable. Thus by this simple device the feed troughs may be supplied with grain or feed gradually and evenly throughout, and the sheep equally fed.

Patented July 11, 1865, through the Scientific American Patent Agency, by Milton Barnard, of Unionville, Chester Co., Pa. For further particulars address him at that place.

A Large Organ.

Messrs. E. and G. G. Hook, of Boston, Mass., have, in process of completion, a huge organ for the Plymouth Church, Brooklyn, of which the Rev. Henry Ward Beecher is the pastor. This organ is to cost $25,000, and is thus briefly described by the Boston *Traveller:*—

"Several new features are to be introduced into the organ which have never before been brought into use in this country, the chief of which is the 'tuba mirabilis,' a reed stop of large scale, voiced on a very high pressure of wind. A gentlemen who heard this range of pipes tried on an organ in England, says the effect was tremendous, and that in the grand chorus at an oratorio it overleaped and overpowered the combined efforts of the full organ and several hundred singers and instruments. It was beyond his power to describe. The Messrs. Hook have the exclusive control of the patent for this improvement for America.

"The organ is to stand behind the pulpit, and to occupy the whole space from the cellar floor to the ceiling of the church. In the cellar will be the hydraulic engines which are to work the organ; on the floor of the church, and rising to the hight of, and behind, the pulpit, will be the bellows chamber; and from the pulpit level, forty feet upward, will rise the magnificent front of the instrument itself, the massive pipes of silver hue and the wood work polished black walnut. The breadth will be twenty-seven feet, and the depth twenty-one feet.

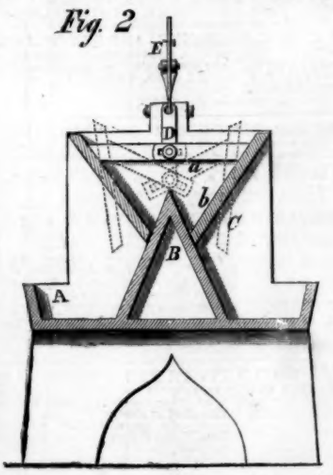
"The front is to be in the Palladian style of architecture, a name derived from that of Palladio, an Italian architect. It will be simple, elegant, and dignified, with nothing of the grotesque about it. A figure holding a harp will crown the instrument, and from above each of the side faces will project in a ray shape the trumpets of the 'tuba mirabilis,' before referred to, bending forward so as to throw the sound over the audience.

"The organ is to have five bellows of different powers, so arranged as to regulate the supply of wind by the demand. The number of stops, counting the registers that work by pedals, is seventy-six; and here another improvement comes in for working the stops, that of the pneumatic levels, one to each stop. The pulling of the stop-key opens a valve, which lets the wind into the particular little bellows-lever attached to that stop, and that does the work of 'stopping' with quickness and certainty, with only a mere touch on the part of the operator. Still another improvement is a series of pneumatic levers for working the whole organ, so that here again the wind of the main bellows does the work in answer to the slightest touch of the artist on the keyboard. When it is understood that, on some great organs, a pressure of the finger equal to five or six or more pounds is required in some instances on a single key, when all the manuals and their connections are coupled, the value of this improvement will at once be seen."

Oxygen Gas.

The *British Journal of Photography*, describes a new method of producing oxygen gas, by J. F. Parker and Joseph Tanner, of Birmingham, England.

Fig. 2



They heat quick lime to redness, with access of air and constant stirring, in order to expel any carbonic acid or moisture that it may contain. Of this prepared lime two parts are mixed with one part of nitrate of soda, by weight. Expose to a bright red heat in a retort. A large quantity of oxygen will be evolved, which must be passed through water before introduction into the gas holder, in order to absorb any nitrous acid which may be formed. By adding one part of nitrate of soda to the residuum, and exposing to heat as before in the retort, a fresh quantity of oxygen can be obtained.

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